THE EFFECT OF INDIVIDUALIZED SELF-PACED SINGLE-GENDER CLASSROOMS ON READING AND MATH SCORES AT THE MCLENNAN COUNTY CHALLENGE ACADEMY IN WACO, TEXAS

A Dissertation

by

MARILYN ANN MARTIN

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

December 2008

Major Subject: Educational Administration

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Approved by:

Chair of Committee,	Jean Madsen
Committee Members,	John Hoyle
	Homer Tolson
	Laverne Young-Hawkins
Head of Department,	Jim Scheurich

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ABSTRACT

The Effect of Individualized Self-Paced Single-Gender Classrooms on Reading and Math Scores at the McLennan County Challenge Academy in Waco, Texas.

(December 2008)

Marilyn Ann Martin, B.S., Texas A&M University;

M. S., Baylor University

Chair of Advisory Committee: Dr. Jean Madsen

The intent of this study is to determine the effects on the reading and math scores of females segregated into single-gender alternative classrooms that had the benefit of an individualized, self-paced curriculum.

The Challenge Academy testing clerk, using the Kaufman Test of Educational Achievement in the areas of reading and math, collected data on the students' first and last days of enrollment. Significant main effects for gender, time, educational status, age, and ethnicity were probed using a general linear model of repeated measures. This quantitative model was used because it provided more flexibility to describe the relationship between a dependent variable and a set of independent variables, manipulated one at a time. Comparisons of between-subject effects and within-subject effects were made using a summary ANOVA followed by ad hoc testing when significance was found when there were three factors being tested, such as school age group and ethnicity. Significance was set at 0.025.

Of the 500 students enrolled over the seven-year existence of the program, only students who had been pre and post tested were included in this research. After removing students who did not meet the criteria, a sample of 150 students remained. This resulted in small and non-existent cell sample sizes, and adjustments were made to the original intent of the study.

The findings observed in this body of research suggest that the gains achieved by males in reading surpassed those of females. Both genders achieved equally in math. A statistical comparison based on gender in special education, school age group, or ethnicity could not be made due to small cell size.

Recommendations for further studies include: (1) a study using a larger sample size allowing for greater numbers in each category; (2) longitudinal studies in elementary, middle, and high schools using annual TAKS scores as the data source; (3) a study considering the gender of the instructor; (4) a study comparing high schools whose majority school population represented each of the three ethnic groups; (5) a study of private schools with single-gender populations.

DEDICATION

This work is dedicated to my husband, Bob. Without his love, patience and unfailing support through all of life's valleys and peaks, this project would never have reached completion. I am forever grateful that he is my soul mate and partner in life.

ACKNOWLEDGEMENTS

I have been engaged in this project for much longer than I intended. Family has had to take precedence over work on many occasions. I am indebted to Dr. Jean Madsen, the chairman of my committee, for her persistence and patience. Her encouragement and advice have provided the motivation to revise and edit this research to make it a body of work that is meaningful. I also offer a special thank you to Dr. Homer Tolson who pushed me harder than anyone to revise, edit, and clarify. Without his recommendations, I would have been lost. To my other committee members, Dr. John Hoyle and Dr. Laverne Young-Hawkins, I thank you for your patience and cooperation with scheduling changes.

Lastly, I am so fortunate to have the love and support of many friends and colleagues who have encouraged and supported me through this project. My husband, Bob, has stood by me unfailingly and gently and lovingly prodded me forward. The Lord has filled my life with many blessings and I remain so grateful.

TABLE OF CONTENTS

CHAPTER Page

LIST OF FIGURES

FIGURE Page

LIST OF TABLES

TABLE Page

CHAPTER I

INTRODUCTION TO THE STUDY

Gender equity in education has been and will continue to be an issue that kindles heated debates. Plato believed that education for females and males should be different, however, in ancient Greece, not much value was placed on even educating females for anything other than domestic chores. This attitude prevailed through the 18th century (Rodney, Crafter & Mupier, 1999). In Colonial America, boys were educated in schools while girls were educated in informal settings at home in what became known as "dame schools" (Jost, 2002). The Quakers started the nation's first coeducational schools. By 1900, 98% of public high schools were coeducational. This movement was driven, not by philosophy, but by the economic demands of the citizens. The number of pupils in school was far too small to provide separate schools for males and females (Rodney, Crafter & Mupeir, 1999). At the time, policy makers believed that providing education in the same setting would benefit females and males and feminists viewed it as a step in the emancipation of women (Jost, 2002). Coeducation, however, did not necessarily mean equal treatment (Rodney, Crafter & Mupier, 1999).

Male educators who complained of the lagging educational performance of males compared to females challenged the idea of coeducation in the twentieth century. In recent decades, feminist critics accused schools of shortchanging girls. The modern

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The style and format for this dissertation follow the *Journal of Educational Research*.

women's movement in the 1960s and 1970s focused on equal access to educational programs and opportunities. This caused nearly 25% of the women's colleges to either close or merge with men's institutions in 1968. The climax of this feminist movement occurred in 1972 when Congress passed the Federal Education Amendments. Specifically, Title IX stated that government funds be withheld from any institution violating equal access to programs for females and males. In 1974, the Women's Educational Equity Act was introduced. This act enforced Title IX and funded research into reducing gender bias in education. The Women's Educational Equity Act was reauthorized in 1993. After winning battles for equal access more than twenty years ago, activists are still seeking reforms of an educational system that they view as weighted against females (Clark, 1994). Others believe that the gender gap of the 1960s has been closed. They believe that the school system now favors girls (Kleinfeld, 1998).

Even though there has been a long history of single-gender private schools in the United States, there are few in existence today. While laws have barred single-gender programs for three decades unless comparable services were offered, the Department of Education has considered revision of those regulations in order to soften the provision (Jost, 2002). In Congress, there is a movement to create a federal Office of Gender Equity. However, critics warn that these efforts to provide gender equity are merely a futile exercise in political correctness (Clark, 1994). The George W. Bush administration has taken strides to simplify the creation of single-gender public schools. Critics have said that this approach offered no real social or educational benefits for boys or girls (Jost, 2002).

The United States offers few settings in which to test the opposing arguments. By the year 2000, there were only thirteen public schools in the United States in operation that conducted some or all of their classes on a single-gender basis. Almost all of them served minority communities (Jost, 2002). Kenneth Rowe, an Australian researcher, examined the academic records of 270,000 high school seniors in an attempt to identify the factors that make a true difference in student learning. One of his key findings was that males and females in single-gender schools scored between fifteen and twenty percentile points higher than their counterparts in coeducational settings (Rowe, 1999). While some view the subject as over politicized and under researched, Cornelius Riordan insists that all of the studies contain evidence of positive effects for both females and males (Riordan, 1990). The effects were stronger for females than for males. The positive effects were always larger for disadvantaged students (Jost, 2002). There is also concern that gender equity solutions have impacted females of different ethnic groups unequally. Hispanic females perform less well than females in other ethnic groups. (Datnow, Hubbard & Woody, 2001).

A two-year pilot project conducted in six California public school districts from 1998-2000 yielded the best opportunity to date to study the effects of single- gender school in the public school systems in the United States. The results, however, were mixed. Professors Amanda Datnow of the University of Toronto, Lea Hubbard of the University of California at San Diego, and Elisabeth Woody of the University of California at Berkeley found that eliminating distractions from the opposite sex helped academic learning especially for females. In at least four of the six districts, minority

students who were at risk were recruited for the program. The majority of programs, however, targeted only students in the middle school grades (Datnow, Hubbard & Woody, 2001).

Statement of the Problem

The Juvenile Justice Alternative Education Program was mandated in 1995 to provide an education for students in Texas who had been expelled from public schools in counties with a population of 125,000 or more. These students were referred to as alternative school students because their educational setting was an alternative to their regular educational setting. In 93% of the twenty-two programs in operation, independent school districts and the juvenile board worked together to organize the programs. The remaining 7% worked independently to set up their own programs (Czaja, 1997). The goal was to provide an effective educational program to help students achieve academic improvement. The curriculum was flexible, which resulted in addressing the unique needs of each student. Academic skills were stressed**,** along with the development of functional job-related skills, daily living skills, and social skills. Direct, positive student-centered instructional strategies were used to address the educational objectives of each alternative student. Student progress, through mastery of defined objectives and standards, was monitored in an ongoing process (Quinn, Rutherford & Osher, 1999).

The problem underlying this investigation was to determine the effects on the reading and math scores for alternative students who were placed in an individualized single-gender, self-paced curriculum taught in a small group setting in an alternative

education program (AEP) known as the McLennan County Challenge Academy. Assessment test scores for all students were compiled upon entering the program, regardless of their special education or regular education status at their expelling school. Post-tests for completers after 180-days were administered by a single testing clerk throughout the duration of the program. Data was compared based on gender, ethnicity, age, special education status and time.

Purpose of the Study

The primary purpose of this study was to determine the effect on reading and math scores of females segregated into single-gender alternative classrooms that received instruction via an individualized, self-paced curriculum. Prior to 1995, these students would have been banned from attending public school for up to one school year after being expelled from their districts. Because of the legislative mandate to provide these students with an education, the students from eighteen school districts in McLennan County were brought together under one program umbrella known as the McLennan County Challenge Academy.

Due to the small school population, the administrative staff made decisions that effected student instruction. Monthly staff meetings were held with discussions of observed student progress and behavior. Six months after the opening of the school, the decision was made to segregate students by gender in an attempt to alleviate some of the discipline problems that were occurring in the gender-mixed classrooms.

All students had previously received instruction in heterogeneous classrooms on their home campuses. The results of student performance in that mixed-gender

environment were reflected in pre-test scores upon entry into the alternative program. Study results of gains or losses in achievement due to gender segregation and an individualized educational plan would be reflected in post-test scores. After comparing the pre and post results of this study, educators may be better able to make decisions regarding single-gender classrooms in order to improve reading and math achievement in alternative settings.

Research Questions

Answers to the following questions were sought in this study:

1. Was there a significant main effect for Gender?
2. Was there a significant main effect for Time?
3. Was there a significant main effect for Educational Status?
4. Was there a significant main effect for Student Age Group?
5. Was there a significant main effect for Ethnicity?
6. Were there any significant 2-factor, 3-factor or 4-factor interactions between Gender, Educational Status, Student Age Group, and Ethnicity by Time?

Operational Definitions

The following definitions were pertinent to this study:

Alternative education: An educational program that embraces subject matter or teaching methodology that is not generally offered to students in traditional school settings.

Demographic characteristics: Age, race, socioeconomic status, and location of neighborhood (urban versus rural).

Exit: The term used to refer to a student's dismissal from the McLennan County Challenge Academy and entry back into their originating school or adult education program.

Expulsion: The termination of a student's right to attend school.

Intake: The term used to refer to the procedures that are initiated immediately upon the students' enrollment at the McLennan County Challenge Academy.

Juvenile Justice Alternative Education Program (JJAEP): A program mandated by Senate Bill I by the Texas legislature in 1995 to provide education to students expelled from the districts in counties having a population of 125,000 or more.

Kaufman Test of Educational Achievement (KTEA): A set of standardized, norm-referenced tests, which are used to measure reading and math levels of students, ages 10 and above.

Low educational achievement: Any student who has more than a two-year lag in grade-level attainment and/or who has failed to earn timely credits required for graduation.

Regular education student: Any student who is receiving non-modified instruction in a traditional school setting.

Single-gender education: A school or classroom in which students are separated and taught according to gender.

Special education student: Any student who is receiving educational instruction with modifications and accommodations based on testing that determines needs based on federal and state statutes.

Term of placement: The amount of time that a student is required to serve at the

McLennan County Challenge Academy, normally 180 school days.

Assumptions

This study encompassed a retroactive review of data and, for the purposes of this project, the following assumptions were made:

1. Participants had not been receiving prior gender-specific interventions.
2. Instruments used in this study accurately reflect the reading and math performance of female and male students being tested.
3. Staff at the McLennan County Challenge Academy at Waco were qualified as represented by their credentials for each task assigned and that they performed these tasks in an ethical manner.

Limitations

Constraints on this study consisted of the following:

1. Findings may be applied only to the population from which this data was obtained.
2. Impact of external pressures outside the school was not the same for all participants.
3. Data were collected from students enrolled in the researcher's school.
4. Data were solely collected from expelled students who are considered at-risk and not from a general school population.
5. Only students assigned to the researcher's school who had completed a 180-day term of placement were studied.

Procedures

The data for this research study included pre and post reading and math test scores collected at the time of student enrollment and exit. The test data were rated on a computer program (Kaufman, 1998) that generated grade equivalents. No additional data were collected from students or staff members, but additional data were retrieved from archival records compiled by the participating school. Permission for testing was received from parents upon enrollment and written permission was given by the program director to access the data files located in the school office.

Data Analysis

The results of the study are reported using both descriptive and inferential quantitative techniques. A Pearson Product Moment Correlation was determined from the intake reading and math scores. If the two dependent variables were not highly correlated, separate Analyses of Variance (ANOVA) for the two dependent variables of reading and math could be conducted using repeated measures in a 2x2x3x3x2 design with repeats on the fifth factor. If the two dependent variables were highly correlated, then a Multivariate Analysis of Variance (MANOVA) of the same design was planned. The significant main effects with more than two levels were probed using The Ryan-Einot-Gabriel-Welsch F test, which compares all groups, and significant interactions were followed up with simple main effects (SME) analyses. All tests of significance were originally planned to be conducted using a .05 alpha level.

The degree to linear relationship between the two dependent variables of reading and math was determined using a correlation analysis. The resultant coefficient is presented in Table 1.

TABLE 1. Correlations for Pre-Reading and Pre-Math Scores

		Pre-Reading Scores	Pre-Math Scores
Pre-Reading	Pearson Correlation	1	.751(**)
	Sig. (2-tailed)		.000
	N	150	150
Pre-Math	Pearson Correlation	.751(**)	1
	Sig. (2-tailed)	.000	
	N	150	150

**Correlation is significant at the 0.01 level (2-tailed).

The data in Table 1 depicts the coefficient for pre and post-reading and math scores. Because of the small sample sizes, tests were run as separate ANOVAs rather than MANOVAs. In order to adjust for the relationship between the dependent variables of reading and math, a Bonferoni adjustment was applied and each analysis was judged using an alpha level of 0.025 instead of the original 0.05 level.

Significance of Study

While there were numerous models for serving the needs of students in alternative programs, there were seven essential elements identified that made these programs effective 1) functional assessments, 2) functional curriculum, 3) effective and efficient instructional techniques, 4) programming for effective and efficient transitions,

5) comprehensive systems, 6) appropriate staff, resources and procedural protection for students with disabilities and 7) educational climates that were supportive of the student's social and emotional needs (Quinn, Rutherford & Osher, 1999).

The McLennan County Challenge Academy has served students since April 15, 1995. During this time, an individualized self-paced curriculum had been developed to meet the needs of all students. Students were pre-tested upon enrollment in order to assist in determining proper placement in the curriculum. While the physical demographics of the program have evolved, the academic thrust regarding reading and math has been constant. The framework of this research is derived from seven years of empirical data collected at this school.

The staff evaluated the overall effectiveness of the program at monthly staff meetings. This face-to-face communication among staff members allowed appropriate changes to be made to the program as deemed necessary by staff observations. As a result, a better understanding of the classroom composition of students and how this factor affected reading and math achievement was utilized in order to determine if further changes in the program should be established. These findings could provide data for further policy changes and change the reading and math curricula in order to design and implement effective alternative educational programs. This data could also be used to determine if self-contained, single-gender classrooms were an appropriate means of educating students.

Contents of the Dissertation

The dissertation is organized into five chapters. In Chapter I, there is an introduction, statement of the problem, purpose of the study, research questions and operational definitions. A review of the literature is contained in Chapter II. The research design and methods are described in Chapter III. The results of the data analyses are provided in Chapter IV. The researcher's summary, conclusions, and recommendations are presented in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

This review is organized under six major headings. In the first section, the researcher examined the historical issues of gender in education. Section two contains research regarding gender differences in educational achievement. The third section contains research regarding ethnic differences in educational achievement as they relate to gender. The fourth section is a review of gender differences in special education versus regular education. In section five, research in alternative education programs (AEP) as they relate to gender differences are explored. The last section contains a summarization of research conducted in the arena of juvenile justice alternative education programs (JJAEP) with regard to gender differences.

In this review of literature, attention is given to risk factors that have been studied to provide more guidance in designing programs for the future that do not follow the historical patterns of education. The focus was on the utilization of single-gender education. Significance was measured by an increase in educational achievement in the areas of reading and math over a 180-day term of placement.

Section I: History of Gender Differences

Emulating European academic traditions, women were females, and as such, were also barred from American schools for nearly two centuries. Seminaries were a popular form of education for females in the early nineteenth century. The teachers in seminaries taught morals, manners, the mind, and motherhood. Teaching itself was considered an appropriate career for young women who wanted/needed to pursue a

vocation. In 1833, an American named Mary Wollstonecraft broke with tradition and argued in favor of educating boys and girls together. A rapid increase in the enrollment of females in American schools was noted during the nineteenth century with the advent of compulsory education. By 1890, the trend was to see more females enrolled in American high schools than males (Lucidi, 1994).

Since the 1890s and despite the belief that public education should be available to every child irrespective of gender, ethnicity, or economic status, according to a study by the American Association of University Women, this is not a reality (American Association of University Women, 1992). In the school systems of the United States, there is an unconscious ignorance of the growing achievement gap between male and female students, with young women not participating equally in the educational system (Lucidi, 1994). Discrimination on the basis of ethnicity and gender has always persisted in schools. Females were not admitted in school until many years after there were schools for males. Even then, females were not taught the same subjects as males, or the same rigorous curriculum, if those subjects were offered. Females were generally taught domestic skills rather than subjects dealing with core academics (American Association of University Women, 1992).

Society still often holds different expectations for males and females that generate different patterns of behavior toward students depending on their gender (American Association of University Women, 1992). Equity in education must be achieved in order for the United States to effectively compete in the global marketplace (Lucidi, 1994). The emergence of the women's rights movement during the 1960s

helped fight against discrimination based on gender. Title IX of the 1972 Federal Education Amendments prohibits discrimination on the basis of gender in institutions of education that received federal aid. During the 1980s, discrimination was allowed to continue to thrive when federal support for research on gender equity dropped sharply (American Association of University Women, 1992). Gender differences in education are manifested in different areas. In this review of literature, the researcher gives indications that females and males internalize information and ideas differently. They respond uniquely to pictures and ideas in curricula. Their interaction with teachers varies and overall academic achievement varies in educational settings.

Gender Differences in Academic Performance

Gender differences in school performance have only recently begun to receive attention again in scholarly research. In 1989, gender bias was discussed in only 1% of articles published in professional journals (Sadker & Sadker, 1984). Theories which attempt to explain some of the gender differences in education focus on different socialization of the genders (Eccles & Jacobs, 1986). However, biological or genetic explanations are not found in the research conducted in the early 80s (Benbow & Stanley, 1980). Scholars have focused on social, psychological and cultural determinants such as different exposure to courses, differing treatment by teachers, classroom organization, differing levels of self-esteem, and different opinions about the students' own abilities and occupational aspirations (Willis, 1995). Overall, research that spans the last twenty-five years reveals consistently that males receive more

attention from teachers than females, both disciplinary and academically (American Association of University Women, 1992).

Gender gaps are manifested in many ways (Willis, 1995). While the goal for all students is to graduate from high school, in 2004 the drop-out rate for males was 11.6%, and females left high school at a rate of only 9%. While males make up half the general population, they made up 56.8% of the dropouts (U.S. Census Bureau, 2004). Statistically, one child is dropping out of school every sixteen seconds of every single school day. (Splittgerber & Allen, 1996).

Little attention is given to girls in the current debates regarding education. The implication that schools provide both females and males with identical educational experiences is assumed (Clark, 1994). Mary Berlenky presented evidence of gender bias in favor of male students commonly used in traditional teaching methods, such as question and answer sessions that follow teacher delivered lectures. Males are more likely to participate with more frequency and effectiveness than females, thereby further broadening the disparity between the male and female academic experience (Berlenky, 1986).

In a study, Mary Berlenky revealed that the traditional presentation of curricula was at odds with the ways females understand and interpret the world. The curricula reflected, and were congruent with, the socialization experiences of men (Berlenky, 1986). Many of the textbooks used in the United States during the 1970s were analyzed and Ms. Berlenky suggested that nearly all of these texts enhanced gender-role stereotyping by their failure to include females in stories and illustrations. They also

isolated information about female characters in a manner that showed them as irrelevant (Streitmatter, 1999). In 1900, although 98% of all public high schools were coeducational (Clark, 1994), researchers have shown that males and females have different experiences in the coeducational classroom. This is largely due to different treatment by teachers and, secondly, because females approach learning differently than males (Schwartz & Hanson, 1992).

While girls and boys have equal measured abilities when entering school, on certain measures of school readiness, such as fine motor control, girls are ahead of boys (Clark, 1994). Boys are more likely to receive both positive and negative attention from their teachers regardless of the gender of the teacher or the age of the student. This holds true even in classrooms where teachers consciously work toward gender equity. School culture, in general, is male oriented. Males dominate the classrooms, and their achievements tend to be more celebrated. Coeducational public schools are places where young women feel disenfranchised and receive fewer opportunities quantitatively and qualitatively than male students. Females are less safe in school than males. Violent acts claim more young men on the streets while acts of harassment and abuse are most often directed at girls in school hallways and classrooms (Streitmatter, 1999).

Even the way that females learn is different from their male counterparts. Females tend to build ideas on top of each other with the interrelationship of thoughts and actions being their principal goal. Male students learn best through individual activities, which is the organizational pattern of most classrooms (Schwartz & Hanson, 1978). After twelve years, however, females have fallen behind males in the areas of

mathematics and self-esteem. In academic areas, there is an even lower level of self-confidence among African American females (Clark, 1994**).**

Girls in girls-only classes speak of their sense of being focused as learners and of being in control of the classroom. Single-gender classrooms allow girls to create their own space and culture. They feel valued as they are. They behave in more caring and considerate ways toward each other. They are more able and willing to take risks. They feel better about themselves in math and science. This attitude illustrates a strong link between student's confidence levels and achievement. This positive attitude of females in girls-only classes toward math and science suggests that achievement has been enhanced beyond what it would have been in a mixed gender class (Streitmatter, 1999).

Today, educational differences slightly favor males in mathematics, but due to educational treatments, the former differences have been reduced considerably. A four-year study released by the Educational Testing Service revealed that from 400 different tests and more than 1,500 different data sets, gender differences were very small for most subject-matter tests. A substantial close of the gender gap was noted in 12^{th} grade females in math over the past 30 years. In 1988, females consistently earned higher grades and were more likely to be in the highest quartile of self-reported grades. Females were less likely to repeat a grade. The researchers also found that more males than females are diagnosed with learning disabilities, with three times more males than females enrolled in special education classes. Cornelius Riordan suggested that the nationwide effort to raise the achievement levels of females has been effective.

Unfortunately, this trend now shows that males, rather than females, are now more likely to be on the negative end of the gender gap in schools (Riordan, 1999).

General data on the success of single-gender educational experiments is scarce. Researchers suggest that single-gender schools offer benefits to people from lower and middle class backgrounds (Clark, 1994). Classrooms remain places where males dominate and females are likely to feel less equal. Consequently, the need to be realistic with resources lies in the development of single-gender classrooms being acknowledged at the federal level. Local voices with positive experiences in single-gender classes must be acknowledged as legitimate. Federal policy that creates space for single-gender classes is important to ensure that gender equity remedies can be integrated, as well as other actions, which are necessary to further ensure the success of these classes (Streitmatter & Allen, 1999). Historically, the group that was valued least had fewer resources and opportunities. Gender stereotyping like those found in curriculum materials exacerbated the situation for females (Sadker & Sadker, 1984).

Gender Differences in Curriculum

Curriculum is often viewed as the central message-giving instrument of schools. Strong messages have been sent to both genders about what is important, valued, and accepted in terms of gender stereotypes (Lucidi, 1994). Females are less likely to be studied in history or read about in literature. Math and science problems are more often framed in stereotypically male terms. Illustrations in most textbooks depict a world populated and shaped by males (Sadker & , 1984). Females are the only gender entering school scoring ahead and then, twelve years later, leaving school scoring behind (Sadker,

1984). By leaving females on the sidelines in discussions of educational reform, we deprive our world of the full potential of half its workforce, half its citizenry, and half its parents for the next generation and future generations that follow (American Association of University Women, 1992).

Because most teachers rely heavily on literature and textbooks to guide their teaching, written and illustrated gender bias both seem to be at the core of the equity problem in schools. For example, stereotyping in literature can be found in the Caldecott award winning books. The majority of females depicted in these books are shown as caretakers while the males act as fighters, explorers and adventurers. From 1953 to 1971, these books had eleven times as many males pictured. In one-third of the winning books, there were no women at all (Sadker & Sadker, 1984).

Words and images in the textbooks of one hundred thirty-four elementary schools were studied. Male-centered stories outnumbered female-centered stories by five to two. Adult males outnumbered adult females by three to one. Male biographies outnumbered female biographies by six to one. Even male fairy tales outnumbered female fairy tales by four to one. Many female inventors will never be known because they are not included in history books (Sadker & Sadker, 1984). Therefore, girls are led to believe that, in books, boys' lives are much more interesting than girls' lives (Lucidi, 1994).

A curriculum that is fair to both genders should acknowledge and affirm similarities and differences both within and among groups of people. It should be inclusive and allow both males and females to identify positively with messages about

themselves. It should be accurate and affirmative with a balance in multiple perspectives. A gender equitable curriculum should also integrate the experiences, needs and interests of both males and females (Lucidi, 1994). As curriculum issues affect the learning of females and males, teacher training with an emphasis on academics plays an important role in student achievement (Sadker& Sadker, 1984).

Gender Differences in Teaching Methods

Research spanning the past decade contains evidence that males consistently receive more attention from teachers than females. The pattern begins in preschool and continues through high school. Boys simply demand more attention**.** One way in which this is demonstrated is that boys call out answers more often than girls in the classroom (American Association of University Women, 1992).

There is evidence in research that, when students begin working on an activity with little introduction from the teacher, everyone has access to the same information. In an extensive study conducted over multiple states, researchers found that in math classes, when the students read the book, did the problems, and then had classroom discussion, females outperformed males in two of five tests and scored the same as males in the other three tests. However, in traditional classrooms, topics are discussed first, and then students read the book and do the problems. In this setting, males outperform females (American Association of University Women, 1992).

Classrooms where no gender differences were found in math instruction utilized less social comparison and competition. Learning was connected to each individual's

personal experiences and perspectives. These dual-gender-proficient classrooms emphasized collaboration (American Association of University Women, 1992).

Cooperative learning has been viewed as an education strategy that has potential for success. By design, it eliminates the negative effects of classroom competition while promoting cooperation, increasing heterogeneous and cross-race relations, boosting academic achievement, and mainstreaming students with disabilities (American Association of University Women, 1992). Innovation in teaching strategies is also a factor affecting the interaction between teachers and students in the classroom.

Gender Differences in Teacher-Student Interaction

The content of teacher comments also differs according to whether teachers respond to male or female students (American Association of University Women, 1992). Myra and David Sadker conducted a study over a three-year period of time with 100 fourth, sixth, and eighth graders. Four types of teacher responses were identified. They were: praise, acceptance, remediation, and criticism. The researchers revealed that males received more of all four types of comments from their teachers. Males received more precise teacher comments in terms of both scholarship and conduct. Neither the gender of the teacher or the number of years experience had an effect on this pattern. Through training in classroom interaction strategies, teacher behavior can change, providing a more equitable classroom environment (Sadker & Sadker, 1984).

Some researchers have cited these differences in teacher evaluations as a cause of the lack of academic perseverance, or “learned helplessness”, by females. This concept explains why females tend to abandon academic challenges while males tend to persist.

Females have higher expectations of failure and lower self-confidence when confronting new academic challenges than males with similar abilities (American Association of University Women, 1992).

Researchers of teacher-student interactions have seldom explored the interaction of gender with ethnicity. While the data is limited, indications are that white males receive more attention from teachers than any females. White males also receive more attention than males from other ethnic groups (American Association of University Women, 1992).

Overall, the attention that minority students receive from teachers differs from that given to white students. African American males have fewer interactions with their teachers in elementary school. They are perceived as less able than other students and are perceived less favorably. African American females have less interaction with their teachers than white females, but they initiate the interaction with more frequency than males or females of any other ethnic group. African American females value their educational achievements less than their male counterparts (American Association of University Women, 1992). While the interaction between student and teacher is important, so is the program in which this interaction takes place.

Gender Differences in Educational Facilities

Even though there has been a long history of single-gender private schools in the United States, there are fewer than two-dozen single-gender public schools in existence today. While laws have barred single-gender programs for three decades unless comparable services were offered to both genders, the Department of Education has

considered revision of those regulations in order to soften the effects of this provision (Jost, 2002). In Congress, there is a movement to create a federal Office of Gender Equity (Clark, 1994). The George W. Bush administration has taken strides to simplify the creation of single-gender public schools (Jost, 2002). However, critics warn that these efforts to provide gender equity are merely a futile exercise in political correctness (Clark, 1994). According to David Sadker, the proposed changes require only programs, which are equal in substance, and that interpretation differs from equal treatment or equal facilities. A school might provide a single gender educational option for females but not for males. Cutting edge science equipment for males does not equal up-to-date cosmetology labs for females (Sadker & Sadker, 1984).

Single-gender schooling has been considered by some as a possible tool for improving the education of both girls and boys. There have been documented incidents of gender bias against females in coeducational classrooms. Girls' achievement continues to lag behind boys, although the gaps are narrowing. In a comprehensive review of Catholic single-gender versus co-educational schools, researchers found that there are academic achievement benefits for girls and low-income minority boys in single-gender schools. These schools are also seen as a more comfortable space for girls to learn, adopt leadership roles, become engaged in math, and to show improvements in self-esteem. For both genders, single-gender schools are seen as ways to better manage classroom behavior. Distractions and adolescent peer pressures are both reduced. A significant limitation of these particular Catholic school studies is that most have been

conducted in the private sector. These findings may or may not generalize to public schools (Datnow, Hubbard & Woody, 2000).

The most comprehensive study of single-gender public education was conducted in California. The study was the first in the state to experiment with single-gender education on a large scale. In 1997, six districts opened single-gender academies for both males and females. There were schools of choice. The academies were approved and funded by state legislation as part of a pilot program. The academies were located across the state in a variety of urban, suburban, and rural communities. The student population was diverse in terms of race, ethnicity, socio-economic, and linguistic backgrounds (Datnow, Hubbard & Woody, 2000).

The major goal of the study was to examine the equity implications of single-gender public education. Although educators viewed the single-gender arrangements as a way to decrease distractions among the students, they also saw them as a means to addressing the educational and social problems of low-achieving students. Because timelines were short, little planning went into the implementation of the programs. Staff and leadership turnovers, a lack of political support, and funding issues plagued the statewide program. Parents were attracted to the program, not by an interest in gender equity, but by extra computers, field trips, small class sizes, and the special opportunities that the academies offered. Separate academies were created for males and females on the same campus. This resulted in a dichotomous understanding of gender. Girls were seen as "good" and boys were seen as "bad." In most cases, the traditional gender stereotypes were reinforced. As a result of these issues, four of the six academies closed

after two years and a fifth school closed after three years. There is only one district that was viewed as successful by administrators and continues to operate a single-gender academy. This was most likely due to pre-planning by the administrators and staff coupled with continued financial and parental support for the program. Legislation and lack of support for gender-based reform caused the demise of the academies (Datnow, Hubbard & Woody, 2000). A clear rationale for single-gender education for changes in school composition must exist in order to impact the educational achievement for both genders (Sadker,& Sadker, 1984).

Gender Differences in Educational Achievement

Gender differences manifest themselves in several ways in the classroom. Some of these factors can increase the non-productive time in the learning environment that at-risk students experience. Students in coeducational secondary schools tend to be focused on how they look and what possessions they have rather than on academic achievement. This negatively affects the formal academic school goals. Boys and girls distract each other in many ways (Coleman, 1961).

Research examining the benefits or negatives of single-sex schooling date from the mid-1980s. In the United States, researchers focused primarily on the private sector, Catholic schools in particular, since virtually no other public single-sex schools existed. The majority of the studies come from abroad where single-sex education is more common. In 1982, researchers concluded that single-sex schools provide a climate that emphasizes academics significantly more than coeducation school (Streitmatter, 1999). Girls in single-sex schools demonstrate higher math scores. In 1985, researchers found

that both boys and girls benefited from the single-sex environment, but that boys especially benefited in all areas (Riordan, 1985). Female advocates admitted by the end of the 1990s that the gender gap cut both directions (American Association of University Women, 1992).

The primary argument against classes for girls only centers on the concern that any setting that is separate is also inherently unequal and not beneficial to either group. Proponents argue that this is a form of affirmative action for girls. Unfortunately, assurance of equal access to resources does not ensure equal treatment in the classroom, nor does it create a place where beliefs and attitudes about girls' potentials and capabilities are equal regardless of gender implications (Streitmatter, 1999).

Based on data from 1992 provided by personnel of the National Assessment of Education Progress, females had a higher average reading proficiency than boys in grade 4 8, and 12. The median gender gap was 6% (Willis, 1995). In a review of educational achievement data as reported by the National Assessment of Educational Progress of elementary and secondary students contained evidence that females in all ethnic groups scored higher, on average, than males in reading. In mathematics, there were essentially no differences between males and females reported in the research (Education Testing Services, 2001).

The gender gap in schools is two-sided. In 1999, reports confirmed that males were increasingly on the negative side of the gender gap in matters of education. In the past, females were on the lower end of the gender gap on almost all educational outcome

indicators (Riordan, 1999). By 1998, however, females outscored males across racial and ethnic groups in reading in grades 4, 8 and 12 (Coley, 2001).

A large portion of the single-gender research has focused on math performance. Boys and girls begin school on an equal footing, but by the twelfth grade, females lag behind males in math performance. The differences begin to increase at grade seven. A similar trend is not seen in reading; females consistently have higher scores than males (Willis, 1995).

Huge differences in gender performance have been reported in mathematical aptitude and achievement. Middle school girls excel in computation while males excel on tasks requiring mathematical reasoning ability (Benbow & Stanley, 1980).

In 1992, males had a higher average proficiency than females in math. However, the only significant differences were at grade 12. Gender gaps in average math performance were shown for 4^{th} and 8^{th} grade with males scoring higher than females at both grade levels (Willis, 1995).

Extensive data was collected for the Study of Mathematical Precocious Youth over an eight-year period to examine mathematical aptitude in approximately 10,000 males and females prior to the onset of differential course taking. Large gender differences in mathematical aptitude in males and females with identical formal educational experiences were reported in the data. Students were selected to participate in six talent searches by exhibiting high mathematical ability. Students were tested using the College Board's Scholastic Aptitude Verbal and Mathematics Tests. Females constituted 43% of the participants. Most students scored high on both testing measures

as opposed to a wide range of scores. Males and females scored equally well on the verbal portion of the tests. A large gender difference in favor of boys in mathematical ability was observed in every talent search. The smallest mean difference in the six talent searches was observed in 1979. That difference was 32 points in favor of males. The mean differences for males raged from 2.5 to 11.6 points. On the average, the males scored about one-half of the females' standard deviation better than the females in each talent search. All students had been certified initially to be in the top 2nd, 3rd and 5th percentiles in mathematical reasoning ability.

In a follow-up survey, the gender differences in favor of males found at the time of the testing was sustained and even increased through the high school years. For example, a 40-point mean difference in scores increased to a 50-point mean difference by the end of twelfth grade. This study favored the hypothesis that gender differences in achievement and attitude toward mathematics result from superior mathematical ability in males (Benbow & Stanley, 1980).

Section II: Gender Differences in Educational Achievement as They Relate to Ethnicity

Educational achievement is not only impacted by gender, but also by the issues that relate to the student's ethnic background. A factor that frequently gets lost in the push toward gender equity is the influence of ethnicity (Salomone, 2003). In a report from the Educational Testing Service Policy Information Center, Richard Coley found that gender differences did not vary significantly from one ethnic group to another on most measures (Ewing, 2001). African Americans and Hispanics account for nearly

one-third of the school population nationwide. Demographers predict that this will grow to two-thirds during the next fifteen years, with particularly rapid growth in the Hispanic population. Birth rates for females between the ages of 15 and 17 have dropped by 23% for African Americans and 5% for Hispanics; however, these numbers are much higher than for Whites. Many of these children live in poverty. During the 1990s, the number of children in working poor families increased from 4.3 million to 5 million. The number of children living in impoverished neighborhoods has reached 93% for major metropolitan areas in the United States. Many of these children are minority children (Salomone, 2003).

In preschool, 14% of Hispanic children, 25% of African American children, and 30% of others are able to recognize the alphabet. This produces an achievement gap in kindergarten in reading and math skills. These deficits reach a critical point in middle school. As the children fall progressively further behind, they are more likely to drop out of school. In 1999, 12.6% of African Americans and 18.6% of Hispanic students between the ages of sixteen and twenty-four dropped out of school compared to 7.3% of Whites. Despite the overall decline in the dropout rate since 1972, the rate has not changed significantly for Hispanic males due to the growing immigrant population (Salomone, 2003).

In an effort to provide equitable educational opportunities to all students, extensive research has been conducted on the effects of racial and ethnic differences on learning and achievement. A great debate has also arisen regarding which gender has

been most shortchanged. Therefore, researchers have considered the impact of ethnicity on gender differences on a minimum basis (Coley, 2001).

In a study of gender differences in elementary and secondary education within racial and ethnic groups, students of three grade levels were tested in a nationally represented sample. In reading samples administered in grades 4, 8, and 12, females scored higher than males across all racial and ethnic groups. The gap widened as the students progressed through school. White males scored higher than white females in mathematics in grade 4. No differences were reported within the other groups. By grades 8 and 12, there were no gender gaps noted (Coley, 2001).

Coley's analysis lacked conclusive findings about a gender gap in student achievement as measured by standardized tests. This suggests that there is no systematic disenfranchisement of students of either gender, although there are persistent gender differences with regard to course selection and specific achievement in subjects. The difference seems to be in educational access and attainment among students of different race and ethnicity. For example**,** white students are far more likely to have advantages that other students do not have, and African American and Hispanic males lag behind females (Coley, 2001).

Historically**,** African American, Hispanic and low-income students achieve well below White, Asian, and high-income students. As a result, African American and Hispanic secondary students are dropping out of school at higher rates (Anderson & Keith, 1997). A chart depicting the inequality of success for males and females from different ethnic groups was developed by Anderson and is displayed in Figure 1. In the

class of 2000-01, the graduation rate for all students was 72% for females and 64.1% for males. African American females graduated at a rate of 56.2% compared to 42.8% for African American males. The graduation rate for Hispanic female students was 58.5% compared to 48.0% for Hispanic males. White female students graduated at the rate 0f 77% while white males graduated at the rate of 70.8% (Swanson, 2003). This information is displayed in Table 2.

TABLE 2. 2001 Graduation Rates by Gender and Ethnic Group

Group	Nation	Northeast	South	Midwest	West
All Students	68.0%	71.0%	62.4%	74.5%	68.2%
Females	72.0%	71.0%	68.3%	77.0%	72.9%
Males	64.1%	64.9%	58.8%	70.9%	64.7%
African American					
Females	56.2%	44.9%	59.4%	52.0%	57.5%
Males	42.8%	35.7%	44.4%	39.2%	47.5%
Hispanic					
Females	58.5%	42.9%	60.4%	57.8%	61.0%
Males	48.0%	34.6%	49.5%	44.6%	50.3%
White					
Females	77.0%	79.9%	72.1%	80.2%	78.5%
Males	70.8%	74.5%	64.9%	75.3%	71.5%

The information displayed in Table 2 contains the graduation rates from the school year, 2001-2002 for females and males from each of three ethnic groups. Graduation rates from the Midwest region surpass the other three geographic areas. The Northeast has the lowest graduation rates for African American and Hispanic students.

White students in the South have lower graduation rates than the other two ethnic groups.

Outcomes of Learning: Results from the 2000 Program for International Student Assessment (PISA) was a study conducted across ethnic and gender groups. According to the findings in the study, there was evidence that White 15-year-old students outperformed African American and Hispanic students in reading and mathematics (Thomas & Redding, 2001). Females in all ethnic groups scored higher than males in reading according to a report from the personnel of National Assessment of Educational Progress. However, in mathematics, no differences were found. Males had higher average SAT I scores than females across all ethnic groups. The exception was that African American females scored higher than African American males on the verbal portion of the SAT I test (Ewing, 2001). The inattentive, withdrawn behavior of at-risk students, an early form of academic disengagement, is exhibited more commonly among minority students. These minority students scored significantly lower than disruptive students on all achievement measures (Finn, 1998).

There are inequalities in the quality of education provided to students in predominantly white suburban schools compared to those provided to students in predominantly black urban schools. These inequalities have persisted over time, even when change is possible. The future focus must shift from effective or ineffective schools to solutions for individual students in every school. Adviser-advisee mentoring and cooperative learning are approaches that have been used to be effective with students due to the emphases on success for the individual and for the individuals within

groups (Splittgerber & Allen, 1996). Despite gains in overall achievement, there is a gap in test scores between African American and white students since the mid 1980s in almost every age group and in every subject. This phenomenon has reversed the gains made in the previous fifteen years (Salomone, 2003).

Recently, there have been changes in Federal education policy that have spotlighted the achievement gap. The *No Child Left Behind Act* requires all states to set the same performances goals for children with disabilities and from all major ethnic and racial groups. Within a school, if any student subgroup consistently fails to meet the performance targets, the districts must provide school choice and supplemental services to these groups of students. Eventually, the school administration must be restructured. Schools are now considered successful only if they close the achievement gap (National Governor's Association Center. for Best Practices, 2006).

One way to measure the achievement gap is to compare the academic performance of African American, Hispanic and White students on standardized assessments. The National Assessment of Educational Progress published data indicating that reading scores narrowed dramatically for both African American and Hispanic students in the 17 year old age group from 1975 to 1988 in programs based in the United States. These gaps, however, remained constant or grew from 1990 to 1999 in both reading and mathematics. Based on the testing data, it was concluded that minority students are about four years behind white students by grade 12. Specifically, 17-year-old African American and Hispanic students have reading and math skills

similar to those of 13-year-old White students (National Governor's Association Center for Best Practices, 2006).

In 1990, a study was conducted by the National Assessment of Educational Progress on students in the United States. White males in grades 4, 8, and 12 outscored white females in mathematics. There was an advantage for Hispanic females over Hispanic males in grade 4; however, Hispanic males outscored Hispanic females in grades 8 and 12. African American females outscored African American males in mathematics in grades 4 and 8. African American males outscore African American females with a seven-point margin in grade 12 (Donahue, Voelkl & Campbell, 1999).

In 1992, White males in grades 4 and 12 outscored females in mathematics. In grade 8, the females held a 0.2-point advantage. Hispanic females outscored Hispanic males at all three grades levels. African American males outscored African American females in grades 4 and 12. There was no statistical difference between the scores of African American males and females at grade 8 (Donahue, Voelkl & Campbell, 1999).

In 1996, White males in grades 4 and 12 outscored White females in mathematics. White females held a 1-point advantage at grade 8. Hispanic males outscored Hispanic females in grades 4 and 12 with the females taking the lead in grade 8. No gender gap was noted for African American students in mathematics in grades 4 and 12. The African American females in grade 8 outscored the African American males by a margin of 2 points. (Donahue, Voelkl & Campbell, 1999).

In the academic area of reading, in 1992, 1994, and 1998 the National Assessment of Education Progress assessed the reading proficiency of United States

students. Females in all three ethnic groups outscored their male counterparts at all three grade levels. The margin of difference was as high as 17 points for African American females in 1998 and 6 points for African American and White females in 1998 (Donahue, Voelkl & Campbell, 1999).

Between 1971 and 1999, females increased their educational attainment rates more quickly than males. This resulted in females having a higher rate of high school completion than males (National Center for Educational Statistics, 2000).

In Texas, in the five years since legislation was enacted to show minimum proficiency each year in each student subgroup, the percentage of African American students passing statewide exams rose by 31%. The passing rate for Hispanic students rose by 29% during the same time period. The percentage of White students passing the exam grew by only 18%. The study concludes that the achievement gap in Texas closed by 13% for African American students and by 11% for Hispanic students (National Governor's Association Center. for Best Practices, 2006).

Section III: Gender Differences in Educational Achievement as They Relate to Educational Status

A third factor affecting the academic achievement of females and males is whether or not the student has a learning disability. Many times students have mild disabilities and learn to compensate without formal intervention by the school. At other times, the learning disability is severe enough to require that an individualized educational plan be formulated and followed in order for the student to achieve academic success.

Special education researchers have rarely focused on the issue of gender (American Association of University Women, 1992). Referrals to special education are higher for males. These referrals, however, were based more on challenging behaviors than on poor academic performance in the lower grades (Salomone, 2003). Females were identified with less frequency than males as candidates for special education services. Medical reports indicate that attention deficit disorder and other learning disabilities occur equally in males and females.

Females who are not enrolled in special education services are deprived of the specialized services they need to fully develop. Females with learning disabilities must contend with the limitations our society places on women as well as their disabling condition (Vogel, 1990). In 1988, the United States Department of Education released information regarding the total number of males and females enrolled in special education programs compared to the number of males and females diagnosed with a learning disability. This information is shown in Figure 1.

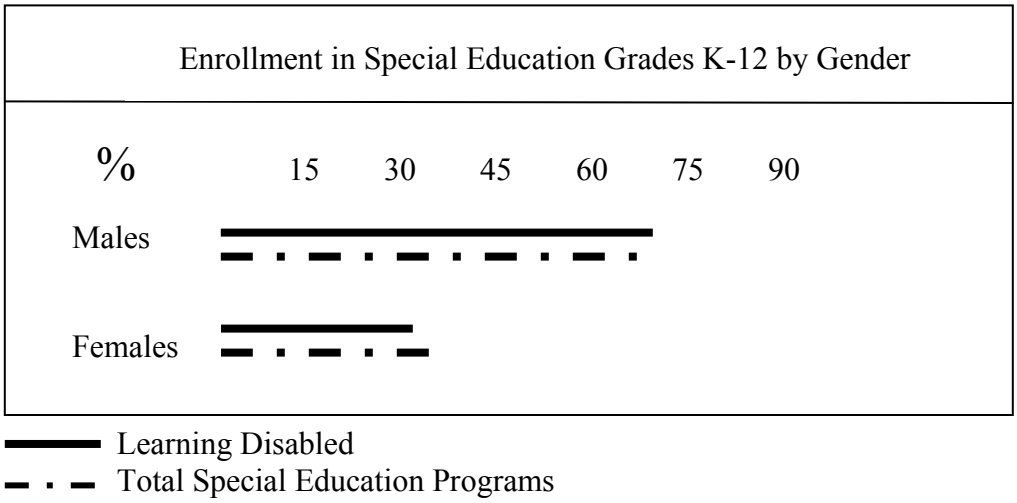

FIGURE 1.—Special Education Enrollment by Gender (U.S. Department of Education, 1988)

As shown in Figure 1, males are placed in special education programs in far greater numbers than females. More of the identified males are labeled as learning disabled. There are few follow-up evaluations of special programs for girls in math; those that are available indicate that interventions can make a difference in performance. For example, six weeks after a one-day math conference, the career interests and course taking path expectations of females were higher than previously reported. Three years after a four-week summer program in math, minority middle school females increased their math course taking path expectations by 40%. Although these programs were not part of the regular school curriculum, they represented the validity of important possible intervention strategies (Anton & Humphreys, 1982).

Section IV: Gender Issues in Juvenile Justice Alternative Education Programs

There is evidence to support the over-representation of males in schools' disciplinary sanctions (Skiba, Peterson & Williams, 1997). Males are four times as likely as females to be referred to the office, suspended, or subjected to corporal punishment. This is the population that is ultimately sent to alternative schools (Bain & MacPherson, 1990).

In the 2004 Juvenile Justice Alternative Education Programs Performance Assessment Report, 81% of the students entering the program were male. This number represents a higher proportion than the number of males in the general juvenile probation population. Data from statewide attendance reports is presented in Table 3 (Juvenile Justice Alternative Education Program Performance Assessment Report, 2004).

TABLE 3. Juvenile Justice Alternative Education Program Students by Gender in 2003

Males	5160	81%
Females	1247	19%

The population statistics in Table 3 have remained static over the years of existence for Juvenile Justice Alternative Education facilities across the state. Roughly 80% of the populations are male with females comprising the other 20%.

Juvenile Justice Alternative Education Program Population Based on Ethnicity

The JJAEP was established to provide an education for youth who were expelled from school. During the 1997-98 school year, there were more Hispanic male students

enrolled in the programs than any other ethnic group. During the fall of 1997, 45% of the students were Hispanic, 27% of the students were African American, and 25% of the students were Caucasian. Of the African American students enrolled in JJAEPs in Texas in 2003, 18.5% were females. Hispanic females comprised 17% of the total number of Hispanic students enrolled in Juvenile Justice Alternative Education Programs while White females were 25% of the total population of white students (Texas State Auditor's Office, 2004). This information is displayed in Table 4.

TABLE 4. Juvenile Justice Alternative Education Program Students by Gender and Ethnicity in 2003

Ethnicity	Male	Female	Total Number	Percent by Ethnicity
African American	1349	308	1657	26%
Hispanic	2594	534	3128	49%
White	1167	387	1554	24%

Combined females from each ethnic group represented 19% of the population of Juvenile Justice Alternative Education Program students in 2003 as shown in Table 4 (Juvenile Justice Alternative Education Program Performance Assessment Report, 2004).

Summary of the Literature

Researchers in the areas of gender and ethnic segregation have shown that there are differences in the classroom experiences of males and females (Schwartz & Hanson, 1978). There are notable differences favoring girls in language use and writing while the differences in reading and vocabulary are smaller. Males outperform females on math concepts and spatial skills; however, girls outperform males on computation and abstract reasoning skills. There are no significant differences based on gender in math scores at grade four, however, the differences grow to become significant in favor of boys by the eighth and twelfth grades (Salomone, 2003). Females in all ethnic groups attained higher scores in reading with no differences in math (Ewing, 2001). While gender differences were small for most subject matter tests, females earned higher grades (Riordan, 1999). There is a difference in the rate of completion for high school graduation (National Center for Educational Statistics, 2000).

Although there is a scarcity of research regarding single-gender schools, Charles S. Clark has been suggested that single-gender education would benefit students from lower and middle class backgrounds (Clark, 1994). Feminists have strongly objected to research on sex differences believing that the issue itself was politically motivated, unscientific, and ultimately harmful to women's social equality. For feminists, education was simply a matter of social conditioning, discrimination, and denied opportunities. There is agreement that innate abilities respond to outside influences and these can either reinforce their strength or counteract their weaknesses. These innate tendencies create a cultural lore, which children pick up from their environment and

adapt them further to a normative view, which becomes grounded in a biological reality. Children develop different ways of responding and making sense of their environment (Salomone, 2003).

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Introduction

A review of the literature has demonstrated that, while there is agreement on the treatment of students-at-risk of failing or dropping out of school, there is little agreement on the development and construction of alternative education programs for these at–risk students. There is disagreement on the merits of multi-age and multi-grade level groupings as well as single-gender groupings. There are proponents of single-gender education who believe that males and females learn differently, therefore, they should be taught differently. The archival data and testing procedures used by the researcher to accomplish the purpose of this study are presented in this chapter. Chapter III is organized into four sections. The first section contains the description of the population of the study. The second section contains a description of the instrument used to collect the data for this study. In the third section, the data collection procedures are reviewed, and the statistical procedures to analyze the archival data are discussed. The fourth section contains the research questions.

The purpose of this study was to give evidence to support that there were significant changes in pre and post-testing of reading and math scores for female students in single- gender classrooms in an alternative program with comparisons in reading and math based on gender, educational status in special education and regular education programs, school age group, and ethnicity. In this study, the researcher

attempted to show that females receiving instruction in single-gender classrooms derive more benefit and academic success than males.

The researcher's position at the McLennan County Challenge Academy was that of Coordinator of Curriculum. The duties encompassed all educational aspects of the Juvenile Justice Center. The Director of Operations was named from the area of Juvenile Justice. This individual specialized in juvenile law and had prior experience as a probation officer.

Data for this study were obtained from at-risk students placed in a juvenile justice setting. The McLennan County Challenge Academy was established in 1995 by the legislature of the state of Texas as a Juvenile Justice Alternative Education Program. It opened its doors in the spring of 1996. Students were placed at the Academy by their districts due to severe disciplinary problems that resulted in expulsion from the school districts for a one-year period of time.

A team comprised of the Coordinator of Curriculum, a probation officer, a psychologist, a social worker, and a special education teacher reviewed the transcripts of all incoming students. The parents and student were required to participate in an intake meeting with the Coordinator of Curriculum before the student was enrolled at the Academy. Rules and expectations were explained in-depth. Parents were encouraged to visit or call the school often to check on the progress of their child. Monthly parent meetings were conducted.

The researcher, the Coordinator of Curriculum, then devised a unique individualized program for each student based on team recommendations and results

from the Kaufman Test of Educational Achievement. Teachers followed this plan during the one-year term of placement. student progress was monitored and the individualized program was adjusted when necessary.

The psychologist and social worker met with the students individually and as a group at least one time per week. The probation officer met with each student also on a weekly basis. Specialists from local health providing agencies were utilized as their services were needed.

The first semester of operation proved challenging for everyone concerned. Communication between the Coordinator of Curriculum and the staff was critical to the success of the students and the program. Students frequently moved between the Detention Center and the Academy due to violations of probation or new violations.

The single-gender classrooms were initiated in an attempt to alleviate behavioral problems. When students are in mixed-gender classes, boys tend to show off for girls. Girls are more concerned with their appearance than in their academic achievement. There is note passing, giggling, and trash talking by both genders in an attempt to impress members of the opposite sex. Both genders do not risk asking questions for fear of looking “stupid” or “dumb” to members of the opposite sex. After utilizing single-gender classrooms for a period of seven years, differences in classroom behavior and academic success were noted by the staff at the McLennan County Challenge Academy.

Data Sources

The McLennan County Challenge Academy was composed of students who were expelled from one of the eighteen independent school districts in McLennan County. The archival data used for this study were derived from the population of students who were pre and post-tested in reading and math. Participants in this study included students in middle school and high school in grade levels ranging from the 6th through the 12th grade. Students came from secondary schools with district student populations ranging from 92 students to over 15,000 students. From August 12, 1996 through January 31, 2002, the McLennan County Challenge Academy served 1,134 adolescents. The majority (82%) of these students were males. Students were tested on their first day of class and then, the same test was repeated on their last day of class after completing 180 days of instruction. Students were placed in classrooms by gender and age group. Because of the small number of female students in the school, the females were all taught in the same classroom.

Since many of the students did not complete the program, a question of sample bias came into contention. A comparison of completers and non-completers was conducted. Table 5 contains the results of reading and math pre-test scores of all students at the Academy during the period of time addressed in this study.

TABLE 5. Group Statistics

	Group Status	N	Mean	Std. Deviation	Std. Error Mean
Pre-Reading	Non-completer	213	106.89	126.73	8.68
	Completer	150	87.09	16.04	1.31
Pre-Math	Non-completer	213	94.35	88.25	6.04
	Completer	150	87.11	18.26	1.49

As presented in Table 5, there were 213 students who were pre-tested in reading and math that did not complete the 180-day program for various reasons. These reasons included relocation of the family, being incarcerated for various civil offenses, home schooling, and death. There were 15 students who refused to take the test. The mean score of the non-completers in reading was 19.80 points higher than the mean score of the completers. The mean score of the non-completers in math was 7.24 points higher than the mean score of the completers.

The results of independent samples tests for the data in Table 6 are presented in Table 6. This test was run in order to provide evidence that there was no bias in the results due to students who did no complete the program.

TABLE 6. Summary of Independent Samples t Tests

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Diff	Std. Error Diff	95% Confidence Interval of the Difference	
							Lower	Upper
Pre-Reading	Equal variances assumed	1.90	361	.058	19.79	10.41	-.68	40.26
Pre-Math	Equal variances assumed	.99	361	.323	7.23	7.32	-7.15	21.62

As presented in Table 6, the completer and non-completer groups are statistically equal in terms of average reading and math scores. Therefore, the results obtained for the 150 completers could be expected to be reflective of the 363 students. Therefore, there was no bias for non-completers.

The sample used in this study was comprised of females and males from three ethnic groups. African American students comprised the largest portion of the sample. White students comprised the second largest portion of the sample, while Hispanic students comprised the smallest group represented by the sample. Demographic numerical data are presented in Table 7.

TABLE 7. Sample of McLennan County Challenge Academy by Gender and Ethnicity

TOTAL SAMPLE	Males = 113 Females = 37
African-American	Males =52 Females = 19
Hispanic	Males =26 Females = 7
White	Males = 35 Females =11

Due to the transient nature of the population, many students did not fulfill the attendance requirements. Students either moved or who were sent to placement by the juvenile authorities with little or no notice, did not complete their 180-day term of placement, and, therefore, were not tested at the time of their exit from the program. The sample for this study, as shown in Table 7, consisted of 113 males and 37 females who were pre and post-tested in reading and math. Of the student sample in this study, 71 students were African American, 33 students were Hispanic, and 46 students were White.

Data Collection

The Texas Department of Juvenile Justice mandates that all students in the state of Texas entering a Juvenile Justice Alternative Education Program be tested using the

Kaufman Test of Educational Achievement (KTEA). The state has never given specific reasons for using this instrument. This testing instrument provides detailed prescriptive information for remediation planning; it is easy to administer, score, and interpret. The KTEA covers all *Individuals with Disabilities Amendments*, *Reading First*, and *National Council of Teachers of Mathematics* achievement areas to ensure comprehensive, research-based assessment. The instrument is used to measure student progress in response to intervention based on test performance. The instrument is age- appropriate for ages four to twenty-five years, which provides a thorough assessment. Reading subtests are used to measure skills for readiness through advanced levels. Math coverage includes early numeric items as well as algebra. All Juvenile Justice Alternative Education Programs use the same testing procedures as specified in the testing manual. The KTEA instrument is an individually administered measure of the academic achievement of children and adolescents in grades 1 through 12. The testing instrument is used to screen students on global skills in reading and mathematics. The norm-referenced scores resulting from this test can be used for group placement, identification of instructional level, and program planning. This testing instrument has been used by government-funded agencies to provide objective information in regards to literacy information. The test results provide an analysis of student's strengths and weaknesses and identify areas in need of remediation or enrichment.

The KTEA offers age-based norms, from 6 years 0 months to 18 years 11 months, as well as grade-based norms. The test was administered by the same testing clerk on both the pre and post-tests. All standard scores of this test provide a mean set at

100 and a standard deviation set at 15 in order to facilitate comparisons with standard scores yielded by other intelligence tests such as *The Wechsler Intelligence Scale for Children* and the *Kaufman Assessment Battery for Children.* All of the KTEA items are not timed. The overall testing time varies from case to case, as there are no minimum or maximum limits. As a general rule, the testing clerk took approximately 30 minutes to administer each section of the test.

1. The reading subtest – This section consists of 52 items. This is an assessment of both decoding printed words and reading comprehension. The first 23 items are used to test for letter recognition and correct pronunciation of a somewhat steeply graded list of words. The more difficult items are designed to assess comprehension by allowing the student to respond orally or by gestures to commands given in printed statements and read by the testing clerk.

2. The mathematics subtest – This section consists of 52 items. It is a measurement of basic arithmetic concepts, applications of mathematical principles to life situations, numerical reasoning, and both simple and advanced computational skills. The written problems compose the easier portion of the subtest. The concepts and applications problems are presented orally, but are accompanied by visual stimuli. The latter items are designed to be more difficult.

3. The spelling subtest – This section consists of 40 items. It is an assessment of the student's spelling ability through a steeply graded list of words,

which are read aloud by the examiner. The words are also used in a sentence. The students write the word or spell it orally.

The administration of the KTEA test is straightforward and scoring is objective. Standardized procedures are followed when administering the test. The instructions are read exactly as they are printed in the manual. Prompts and cues are specified. The same testing clerk administered all tests. The test administration is repeated when a student exits the program after completing their term of placement.

The researcher used archival data collected at both the point of admission and exit from the school. Students were required to attend school 180 days before they were eligible to return to their regular campus. The Kaufman Test of Educational Achievement was selected by the state of Texas as the pre and post-assessment tool to be administered at all Juvenile Justice Alternative Education Programs.

The researcher contacted the American Guidance Service, the company that developed the Kaufman Test of Educational Achievement and requested reliabilities. The following information was received via mail and is reproduced in Table 8.

TABLE 8. Kaufman Test of Educational Achievement Reliabilities

	SUBTESTS	**COMPOSITES**
Reliabilities	Mid-upper .80s	Mid .90s
7-Day Test-Retest	Mid-upper .80s	Low .90s

Reliabilities as reported by the American Guidance Service range from the mid-to-uppers .80s for subtests and the mid .90s for the composite. For test-retest situations with a seven day interval, the correlation was in the mid to upper .80s for subtests and the low .90s for the composite as seen in the Table 8.

Validity within domain subtest Interco relations exceeds validity between domain correlations. The content of the test follows blueprints established from expert curriculum consultants and items were drawn from grade-appropriate textbooks. According to the American Guidance Service, subtests show appropriate patterns of correlation with other achievement measures.

The Kaufman Test of Educational Achievement yields quantitative data on math and reading skills. This test provides diagnostic information that can be used for educational assessment and program planning. The normative data was based on a sampling of more than 3,000 adolescents. Age and grade-based standard scores are based on a mean of 100 and a standard deviation of 15. The American Guidance Service stated that the subtests showed appropriate patterns of correlation with other achievement measures. The detailed reliability information for this test is shown in Appendix A.

Permission to test students using the Kaufman Test of Educational Achievement was granted by parents during the orientation process before the students were enrolled in the Academy. At that time, a packet of information was given to the parents and the students outlining the operations of the Academy, permission to acquire information from the expelling school district, and an explanation of testing procedures. Parents

were informed that the information obtained from KTEA testing would be used to design curriculum unique to their child's strengths and weaknesses in order to make the greatest academic strides possible during a 180-day placement.

Immediately after being enrolled in the program, the student was taken to an office by the testing clerk. The clerk established rapport with the student by introducing herself to the student and by addressing the student by his or her first name. The student was engaged in a conversation focusing on the student's hobbies or interests in order to put the student at ease. A brief explanation of the testing procedures was presented to the student. The testing clerk explained that no student was expected to get all of the problems correct and that some questions were easy and some were more difficult. The student's grade level was used as a starting point for the test. The testing clerk, using a kit containing an easel, a pencil, an eraser, and blank paper, orally presented the items. Items were repeated if the student indicated that it was necessary. No verbal and nonverbal feedback to the student was permitted from the testing clerk during the test administration. The subtest was stopped if a student failed every item in one unit. The testing clerk applied this rule in order to prevent the frustration of consecutive failures by the student. The student was asked to look at pictures and answer oral questions. This procedure continued until the student missed 5 questions within a category. If 5 consecutive items within a category were not missed, the testing continued through all the items.

The math comprehensive form was completed by the student in a format similar to that of a worksheet. It was not timed and the student continued answering questions

until he or she completed the entire form. A student could ask the test administrator to stop due to his/her inability to answer the questions.

The testing clerk read the math applications section and the student answered the questions orally. This procedure continued until the entire form was completed or if the student communicated to the testing administrator that he/she did not want to continue.

The reading-decoding test began with letter identification and continued through 52 words. This procedure varied from the two previous tests. Testing was discontinued only if the student missed 5 consecutive words in one category. Testing continued until these conditions were met.

The reading comprehension section consisted of the testing clerk giving the student oral directions, which the student was then asked to demonstrate. It continued through simple 2-sentence paragraphs. The student was then read a story and answered questions until 5 consecutive questions in a category were missed. There were 52 items in this section.

All test data were then rated on a computer scale, which listed the strengths and weaknesses of each student. The information was given to the instructor via a printout to aid in the formulation of an individualized educational plan.

The test data was used to determine the reading and math proficiency levels of the students. An individualized education plan was developed to address the strengths and weaknesses of each student. Educational gaps were addressed in each plan. Students began working at levels, which ensured success, thus building self-confidence

and self-esteem. Students made progress based on how quickly they mastered concepts. Some students were able to move through content areas faster than others.

Data Analysis

This researcher analyzed two levels of data: (a) data derived from the pre-testing procedures in reading and math and (b) data derived from the post-testing procedures in reading and math. Additional demographic data were also collected to describe the students in this study.

After initial testing, students were assigned to classrooms based on gender. Units of study were designed for each student based on the test results. Individualized curriculum and services, with emphasis on reading and math, were provided over a period of 180 days. Students were retested on the day of their release from the program.

Average scores for pre and post-reading and pre and post-math tests were plotted over time. Frequency distributions of pre and post-reading and pre and post-math tests were fractionated by gender, the students' educational status in special education and regular education, school age group, and ethnicity. A general linear model for repeated measures was used in a comparison of pre and post-math and pre and post-reading scores by gender, status in special education and regular education, age groups, and ethnicity. Comparisons of the between-subjects effects and the within-subject effects were made using a summary ANOVA. Pre and post-testing data for reading and math were defined and compared over time. Between subject factors were Gender, Educational Status, School Age Group, and Ethnicity. The factor of time was plotted on

the horizontal axis while estimates of effect size, observed power, and homogeneity were considered. All tests were conducted using an alpha level of .025.

Rationale

In order to determine if there were any significant main effects and interactions between Gender, Educational Status, School Age Group, and Ethnicity for the dependent variables of reading and math performance, the researcher anticipated using a Gender by Educational Status by School Age Group by Ethnicity by Time (2x2x3x3x2) design with repeats on the fifth factor. The original intent of the study was to compare the mean reading and math scores of male and female students to determine if females benefited from single-gender classrooms more than males. However, cross–tabulation data resulted in cell sizes that were too small or non-existent to continue with this design. Therefore, the researcher analyzed the data samples using separate 2x2 and 3x2 mixed model designs. Gender and Educational Status were compared for reading and math across Time separately (2X2). In the same manner, School Age Group and Ethnicity were compared for reading and math across Time separately (3x2). This provided evidence as to whether or not the groups differed in terms of test scores on the test and the increase or decrease in scores across time. The length of instruction remained constant over a period of a 180-day placement. Significant univariate main effects were probed using Ryan-Einot-Gabriel-Welsch F tests, which compares groups. Simple main effects (SME) analyses were conducted to probe significant interactions. Simple main effects are a procedure used to compare the means of treatment groups in a profile. All tests of significance were conducted using an alpha level of .025.

Data were entered in the Statistical Package for the Social Sciences – Windows version 10.0. Quantitative data were derived from the scores on the Kaufman Test of Educational Achievement. The analyses included both descriptive and inferential procedures. Descriptive procedures, including frequency, percentages, means, and standard deviations, were used to describe the sub-groups for each dependent variable. All data were aggregated by group rather than by individual. Analysis and interpretation of the data followed the principles prescribed in *Educational Research: An Introduction* by Gall, Borg, and Gall (1996). Results from the research study were reported using SPSS Base Version 10.0 for Windows Program (1999).

Research Questions

During this study, the specific research questions examined were:

Research Question #1

Was there a significant main effect for Gender?

In order to measure the changes in reading and math performance during the students' terms of placement, the students' pre and post-test scores on the Kaufman Test of Educational Achievement (KTEA) were classified by gender and were compared and their gains or losses noted.

Research Question #2

Was there a significant main effect for Time?

In order to measure the significant main effect for between each of the factors of Gender, Educational Status, School Age Group, and Ethnicity by Time, separate 2X2 mixed model ANOVAs were run for each factor by Time.

Research Question #3

Was there a significant main effect for Educational Status?

In order to compare the performance of regular education and special education female students, based on pre and post testing results of the Kaufman Test of Educational Achievement (KTEA), archival demographic data were retrieved from school records in the school files.

Research Question #4

Was there a significant main effect for School Age Group?

In order to compare the performance of School Age Groups using the pre and post testing results of the Kaufman Test of Educational Achievement (KTEA), archival demographic data was retrieved from the school files.

Research Question #5

Was there a significant main effect for Ethnicity?

In order to compare the differences in performance of African American, Hispanic, and White students, based on pre and post testing results of the Kaufman Test of Educational Achievement (KTEA), archival demographic data was retrieved from the school files.

Research Question #6

Were there any significant 2-factor interactions between Gender, Educational Status, School Age Group, and Ethnicity over time?

Summary

The purpose of this chapter was to review the procedures and methods used in the study. The research design, setting, sample, and procedures were addressed. Issues of test-retest reliability and validity were discussed. The results of the analyses of data retrieved from the archival files of the McLennan County Challenge Academy are presented in Chapter IV in order to answer the research questions. Students were expelled to the school at different times of the year. The pre-test was administered to the student on their first day of attendance. Students were required to attend school for one hundred eighty days before they were eligible to return to their home campus. The post-test was administered on their last day of attendance before being transferred back to their home campus or another public school.

The results of the study were reported using both descriptive and inferential quantitative techniques. A Pearson Product Moment Correlation was determined from the intake reading and math scores. Since the two dependent variables were highly correlated, a MANOVA was originally planned but because of small cell sizes separate Analysis of Variance (ANOVA) for the two dependent variables of reading and math were conducted. The main effect and interactions were probed using the Ryan-Einot-Gabriel-Welsch F test, which compared each group to one another, and any significant interactions were probed using simple main effects (SME) analyses. This procedure was intended to compare the means of treatment groups in a profile. All tests of significance were conducted using an alpha level of .025.

CHAPTER IV

RESULTS AND ANALYSIS

Introduction

The primary purpose of this research was to determine the effect of individualized self-paced single-gender classrooms utilized at the McLennan County Challenge Academy in Waco, Texas on reading and math scores. The Kaufman Test of Educational Achievement (KTEA) reading and math scores measured at pre and post-testing served as the dependent variables.

For each of the dependent variables, the data analyses were divided into six sections in order to address each respective research question. The research questions addressed were:

1. Was there a significant main effect for Gender?
2. Was there a significant main effect for Time?
3. Was there a significant main effect for Educational Status?
4. Was there a significant main effect for School Age Group?
5. Was there a significant main effect for Ethnicity?
6. Were there any significant 2-factor interactions between Time and each of the independent variables of Gender, Educational Status, School Age Group, and Ethnicity?

Chapter IV contains the analyses of the scores obtained from the pre and post testing results. The data analyses are presented in this chapter using descriptive statistics, mixed model ANOVAs, and mean summaries. The raw data may be viewed in Appendix C.

The school ethnic distribution of the utilized sample was typical of most Juvenile Justice Alternative Education Programs in the state of Texas (Juvenile Justice Alternative Education Programs Performance Assessment Report, 2004). There were 71 African American students who comprised 47% of the sample. There were 33 Hispanic students who made up 22% of the students, and 46 White students representing 31% of the students tested.

Students remained in the program for 180 school days according to the Memorandum of Understanding (MOU), which was signed by the superintendents of the eighteen school districts in the county. Students were pre and post-tested in the academic areas of reading and math by the same testing clerk who had been trained by the school psychologist. Because the at-risk population of the school moved frequently and were incarcerated without notice, the researcher found that only slightly more than 13% of the student population over a seven-year period, had remained at the school for the full term of placement and had been both pre and post-tested. Based on the demographic and testing information from a sample of 150 students who had received educational instruction in a self-pace single-gender setting for full-term placement, the following research questions were addressed.

Results and Analysis for Research Question #1

Was there a significant main effect for Gender?

Reading

The mean reading scores of males and females across time for the pre and post-test are displayed in Table 9. Males comprised 75% of the sample. Females made up 25% of the sample.

TABLE 9. Summary of the Means for Reading Pre and Post-Test Scores for Gender by Time

Gender	Time	Mean	Std. Error	Lower Limit	Upper Limit
Male	1	87.11	1.51	84.12	90.10
(n = 113)	2	88.88	1.62	85.67	92.09
Female	1	87.02	2.64	81.80	92.25
(n = 37)	2	87.59	2.84	81.97	93.21

1= Pre-test
2= Post-test

As depicted in Table 9, the average mean score for the male students increased from the pre-test to the post-test. The average mean score for the female students increased from pre-test to post-test also. The reading scores for Gender by Time were analyzed using a 2x2 mixed model factorial with repeats on the second factor. The ANOVA results are presented in Table 10.

TABLE 10. 2X2 Mixed Model ANOVA for Gender by Time for Reading Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
Gender	26.479	1	26.479	.051	.822	.000	1.00
Error	777131.351	148	521.158				
Time	76.147	1	76.147	2.074	.152	.014	.299
Time * Gender	20.147	1	20.147	.549	.460	.004	.114
Error(time)	5433.549	148	36.713				

Computed using alpha = .025

Based on these mean scores depicted in Table 9 and the associated ANOVA displayed in Table 10, the obtained mean values were judged to not be significantly different from each other. There was no significant main effect for Gender, no significant main effect for Time and no significant interaction for Gender by Time. The various tests displayed in the table enabled the researcher to address the first question regarding gender. The results for reading pre-test scores are displayed pictorially by Gender in Figure 2.

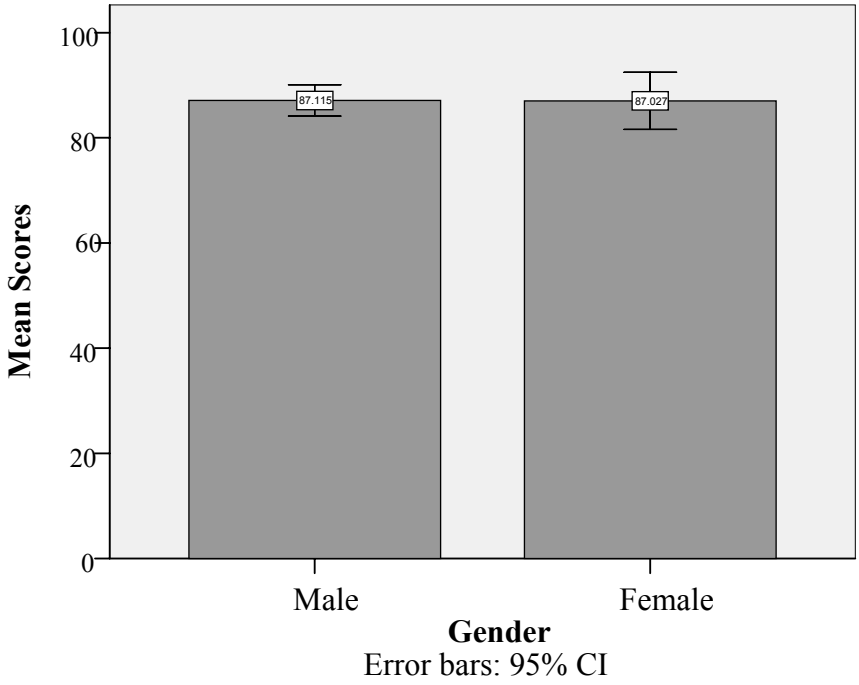

FIGURE 2. Average Reading Pre-Test Scores by Gender (N= 150)

The mean scores, as depicted in Figure 2, for males and females on the reading pre-test that was administered on the first day of each student's enrollment were very similar. The mean score for males was 87.11 while the mean score for females was 87.02. The difference between mean scores was 0.09 points.

After each student completed his or her term of placement, the student was post-tested. The post-test was administered by the testing clerk using the same process that was used for pre-testing. The results for reading post-test scores are displayed pictorially in Figure 3.

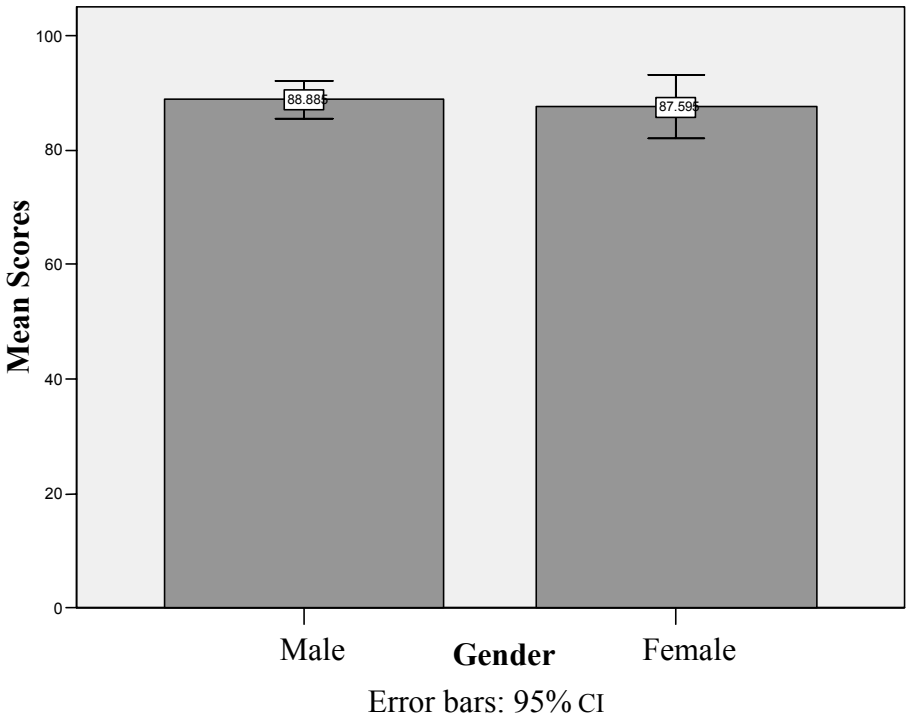

FIGURE 3. Average Reading Post-Test Scores by Gender (N – 150)

The female students posted slightly lower post-test scores on the reading test than the male students as shown in Figure 3. The mean score for males was 88.88 while the mean score for the females was 87.59.

The mean values for the reading pre and post-test are presented graphically in Figure 4. Because there was so little difference between mean scores on both the pre and post-test, the plotted lines are in very close proximity to each other.

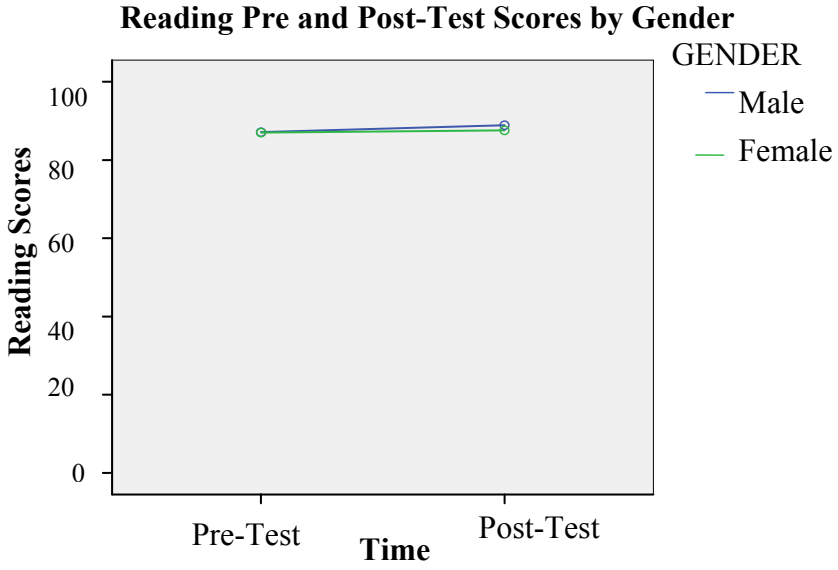

FIGURE 4. Plot for Changes in Performance from the Pre to the Post-Test Average Reading Scores by Gender

The depiction in Figure 4 contains both the reading pre and post-test scores by Gender. The relatively small difference does not represent a significant difference for Gender in reading.

The findings in this research are inversely correlated to the research conducted by the National Assessment of Education Progress in 1992, 1994, and 1998 in which females outscored males in reading in the fourth, eighth, and twelfth grades (Willis, 1995). Females averaged higher reading scores than males in data reported by the Education Testing Services in 2001 (Education Testing Services, 2001). The median reading scores for males were higher on both the pre and post-test than the median scores for females based on the results obtained in this study.

The sample tested in this study contained 67% males versus 33% females. There were no significant main effects for Gender in the area of reading in the results of this study. This means that there was no difference in reading scores for females and males during their placement at the McLennan County Challenge Academy.

Math

Data from pre and post-test math results for Gender were summarized. As with the reading scores, the math scores are similar in range. The mean math scores of males and females across time are displayed in Table 11.

TABLE 11. Summary of the Means for Math Pre and Post-Test Scores for Gender by Time

Gender	Time	Mean	Std. Error	Lower Limit	Upper Limit
Male	1	86.92	1.72	83.51	90.32
(n=113)	2	91.13	1.64	87.88	94.37
Female	1	87.70	3.01	81.75	93.65
(n=37)	2	92.13	2.86	86.46	97.80

1= Pre-test
2= Post-test

As presented in Table 11, the mean score for males was 0.78 points lower than the mean score for the females on the pre-test. The post-test scores represent a similar result. These scores differed by 1.00 point.

A 2X2 mixed model ANOVA for math pre and post-tests for Gender by Time was calculated. A summary of the results for this analysis is presented in Table 12.

TABLE 12. 2X2 Mixed Model ANOVA for Gender by Time for Math Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
Gender	44.392	1	44.392	0.74	.787	.000	.058
Error	89280.354	148	603.246				
Time	1041.528	1	1041.528	28.175	.001	.160	1.000
Time * Gender	.675	1	.675	.018	.893	.000	.052
Error(time)	5470.992	148	36.966				

Computed using alpha = .025

Observing Table 12, there was a significant result obtained for Time. There was, however, no significant main effect for Gender and no significant interaction for Gender by Time. The various tests displayed in the table enabled the researcher to address the math section of the first question regarding gender. The results for math pre-test scores are displayed pictorially in Figure 5.

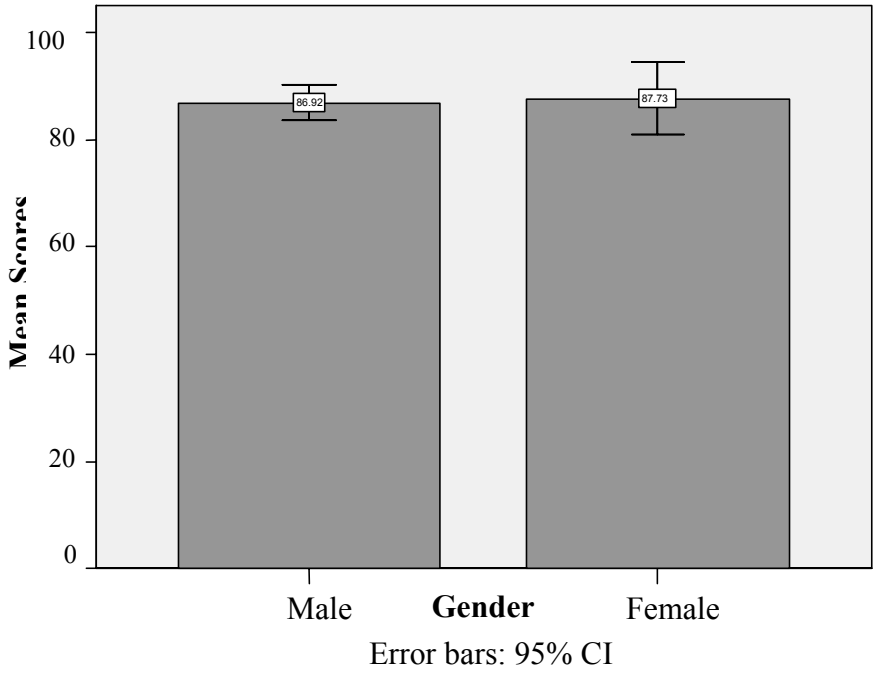

FIGURE 5. Average Math Pre-Test Scores by Gender

The results displayed in Figure 5 were compiled from test data obtained from the math pre-test that was administered on the first day of each student's enrollment. The female mean scores are slightly higher than those of the male students. The mean score for females was 87.70 while the mean score of the males was 86.92. This was a difference of 0.78 points.

The mean scores of males and females were also similar on the math post-test. Again, the female mean score was slightly higher than that of the males. The math post-test mean scores are pictorially display in Figure 6.

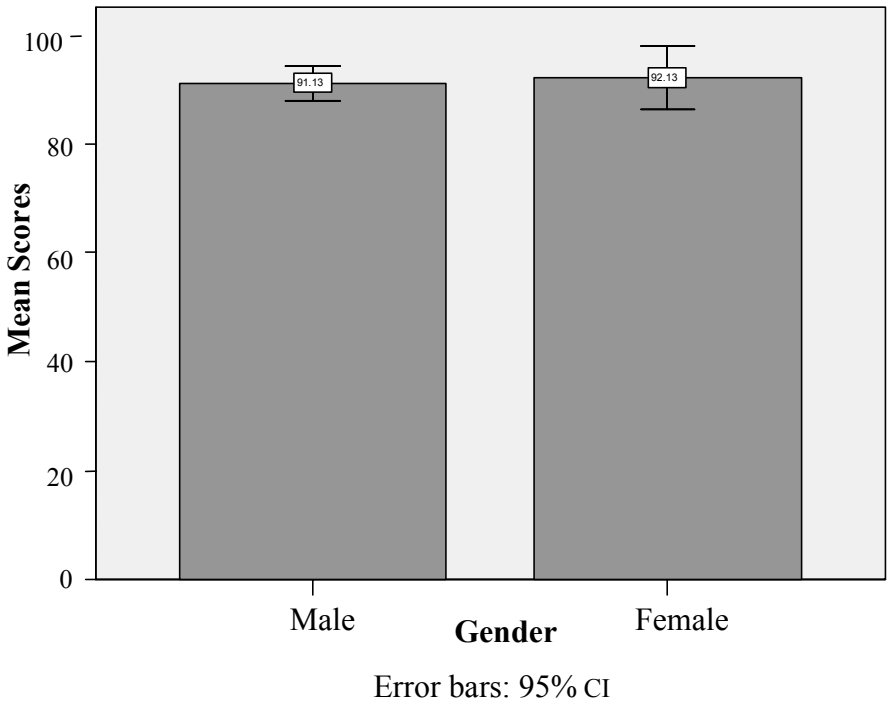

FIGURE 6. Average Math Post-Test Scores by Gender

The data displayed in Figure 5 depicts a similar difference between male and female mean math post-test scores as it did with the pre-test analyses. The females posted higher mean scores. The difference, however, was small.

The math pre and post-test mean scores are depicted pictorially in Figure 7. The plotted lines are in very close proximity to each other because the difference between mean scores on both the pre and post-test was small.

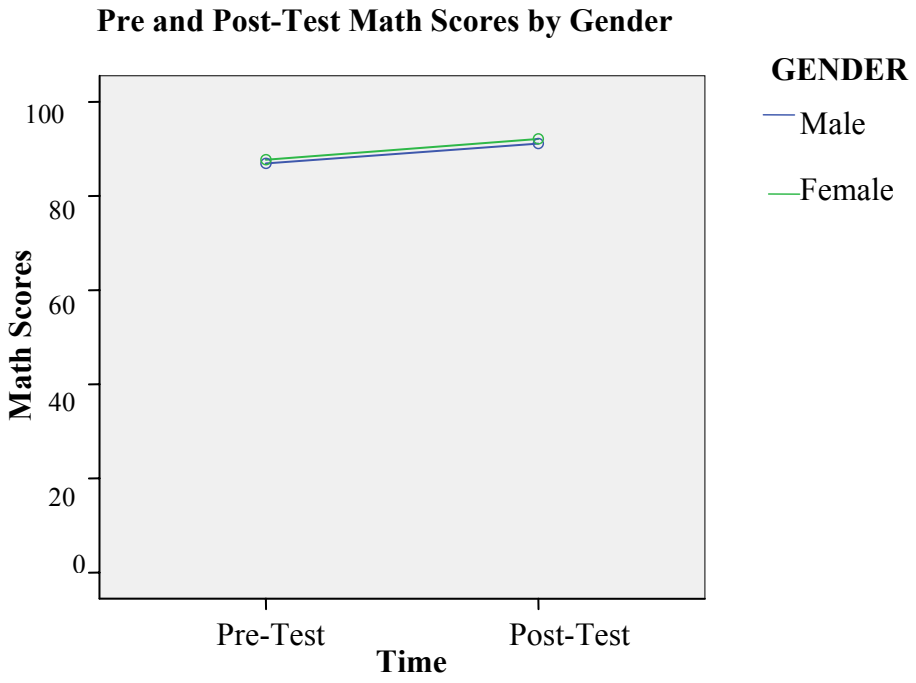

FIGURE 7. Plot for Changes in Performance from the Pre to the Post-Test Average Reading Scores by Gender

Observing Figure 7, the increase in scores from pre to post-test in math was similar for both group and thus the achievement patterns were similar for males and females. The change across time was judged to be significant. There was no significant interaction for Gender by Time.

The findings in this research are supported by the literature. Males had a higher proficiency than females in math in testing conducted in 1992. The difference was significant by twelfth grade (Willis, 1995). The Education Testing Services reported that there were no differences between males and females in math (Education Testing Services, 2001). The difference between pre and post-test median math scores was 0.22

points. The median score of the males was higher than that of the females. There was no significant main effect for Gender in math in the results of this study. However, there was a significant interaction for Gender by Time. Therefore, there was not difference between the median math scores of females and males. There were increases in median scores from pre to post-testing.

Results for Analysis for Research Question #2

Was there a significant main effect for time?

In each analysis, the Time factor was analyzed and answered separately as was reported in research question 1. The results are presented in each of the four other sections of this research.

Results for Analysis for Research Question #3

Was there a significant main effect for educational status?

Testing and placement of students in special education was made by personnel in the student's home district prior to students being enrolled in the individualized, self-paced program at the McLennan County Challenge Academy. Consideration was not given as to whether the special education student's disability was in the area of reading or math. The original intent of the researcher was to compare students by Gender and Educational Status, however, due to small or nonexistent cell sizes, this was not possible.

Reading

The summary of mean scores for both the pre and post-test for Educational Status and Time in the area of reading are presented in Table 13. Students enrolled in special

education classes comprised 39% of the sample. Regular education students totaled 61% of the sample.

TABLE 13. Summary of Means for Reading Pre and Post-Test Scores for Educational Status by Time

Educational Status	Time	Mean	Std. Error	Lower Limit	Upper Limit
Special Education (n = 58)	1	78.65	1.91	74.86	82.44
	2	79.98	2.08	75.86	84.10
Regular Education (n = 92)	1	92.41	1.52	89.40	95.42
	2	93.97	1.65	90.70	97.25

1= Pre-test
2= Post-test

As may be observed in Table 13, students enrolled in special education posted a mean score that was 13.76 points lower than the mean score of students enrolled in regular education on the reading pre-test. The post-test scores were 13.99 points apart with the regular education students posting the higher scores.

The reading scores for Educational Status by Time were analyzed using a 2x2 mixed model factorial with repeats on the second factor. Results for the statistical analysis of reading pre and post-test scores for educational status are presented in Table 14.

TABLE 14. 2X2 Mixed Model ANOVA for Educational Status by Time for Reading Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
Educational Status	13700.175	1	13700.175	31.952	.001	.178	
Error	63457.655	148	428.768				
Time	148.844	1	148.844	4.040	.046	.027	.515
Time * Status	1.004	1	1.004	.027	.869	.000	.053
Error (time)	5452.692	148	36.843				

Computed using alpha = .025

Observing Table 14, significant differences were obtained for Educational Status, but no significant main effect for Time or Educational Status by Time. The various tests displayed in the table enable the researcher to address the third research question of Educational Status.

The mean score for regular education students was higher than the mean for special education students on the pre-test. These mean scores for reading pre-test scores are displayed pictorially in Figure 8.

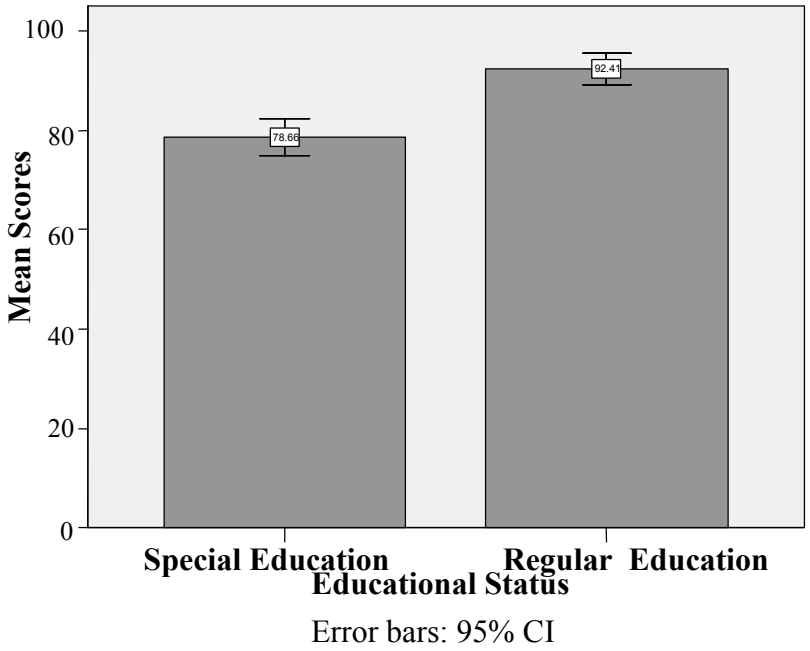

FIGURE 8. Average Reading Pre-Test Scores by Educational Status

The results depicted in Figure 8 are mean scores for the students' reading pre-test. The students enrolled in regular education exhibited higher pre-test reading means than the students enrolled in special education.

The mean score for the regular education students was higher than that of the special education students on the post-test. This result was consistent with the results of the pre-test in reading. The mean scores on the reading post-test are displayed in Figure 9.

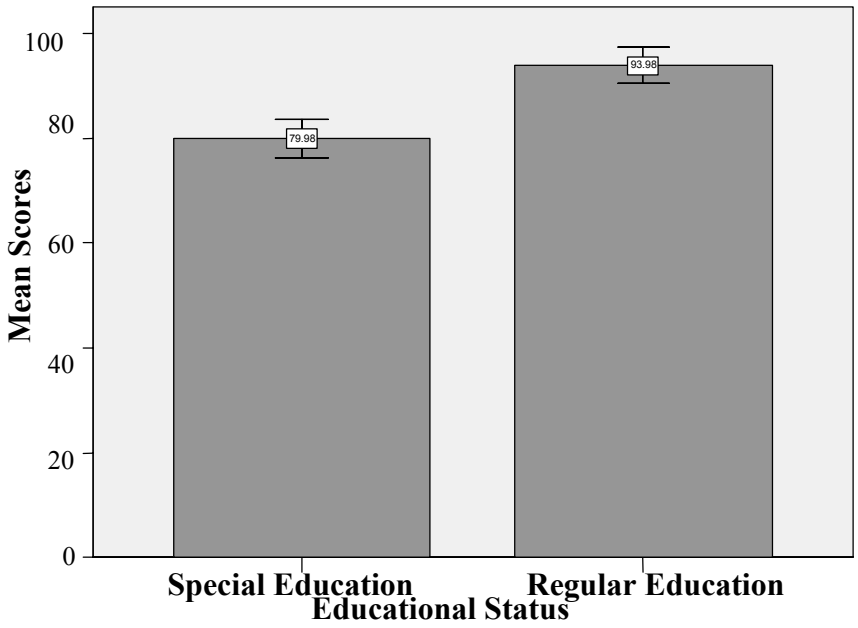

FIGURE 9. Average Reading Post-Test Scores by Educational Status

The results of the reading post-test depicted in Figure 9 are similar to those obtained from the pre-test data. This test was administered on the last day of each student's enrollment. Students enrolled in regular education scored higher than the students enrolled in special education, the results were significant for status.

Data showing growth from pre-testing to post-testing for all students enrolled in both regular education and special education is represented in Figure 10. The progress from pre to post-test was similar for both groups of students. The graph lines depict parallel growth.

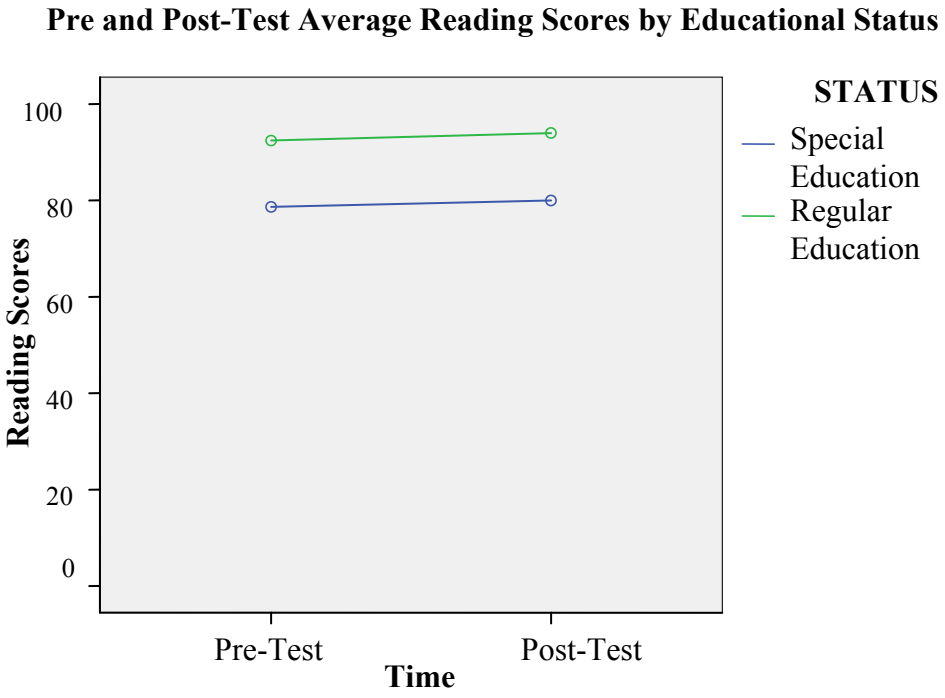

FIGURE 10. Plot for Changes in Performance from the Pre to the Post-Test Average Reading Scores by Educational Status

As shown in Figure 10, almost identical rates of growth are shown in the comparison of reading scores for special education students and regular education students over time. The regular education students recorded higher pre-test scores than the students in special education. The regular education students also scored higher on the post-test than their counterparts in special education. An implication for this growth pattern would be that, although the regular education students started the program with a higher knowledge base than the special education students, there was improvement over

time for both groups after being instructed with an individualized self-paced curriculum in single-gender classrooms over a 180-day term of placement. This improvement, however, was not statistically significant.

Females were referred and identified less frequently than males (Salomone, 2003). Because of the small or inexistent cell sizes, this study was unable to consider special education and regular education females versus special education and regular education males.

In medical reports published in 1990, learning disabilities occur equally in males and females (Vogel, 1990). Of the 58 students enrolled in special education who were both pre and post-tested, only 12 were females. This number represented only 12% of the sample, but 48% of the entire female sample. The other 46 special education students were male, representing 41% of the male sample. Although the percentage in each population is unequal, so were the sample sizes. There was a significant main effect found for Educational Status in the area of reading, meaning that there was a difference in reading scores between special education students and regular education students.

Math

Data from the pre and post-tests for Special Education students and Regular Education students was compared across Time. Descriptive data for math pre and post-test scores for Educational Status by Time are presented in Table 15.

TABLE 15. Summary of the Means for Math Pre and Post-Test Scores for Educational Status by Time

Status	Time	Mean	Std. Error	Lower Limit	Upper Limit
Special Education (n = 58)	1	78.01	2.20	73.65	82.38
	2	81.86	2.06	77.78	85.93
Regular Education (n = 72)	1	92.84	1.75	89.38	96.31
	2	97.38	1.63	94.14	100.61

1= Pre-test
2= Post-test

Table 15 contains the data for the summary of the mean scores for both the math pre and post-tests. On the pre-test the special education students posted a mean score that was 14.83 points lower than their counterparts in regular education. Post-test mean scores were 15.53 points apart.

The math scores for Educational Status by Time were analyzed using a 2x2 mixed model factorial with repeats on the second factor. The mixed model ANOVA table for Educational Status by Time in the area of math is presented in Table 16.

TABLE 16. 2X2 Mixed Model ANOVA for Educational Status by Time for Math Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
Educational Status	16382.566	1	16382.566	33.240	.001	.183	1.000
Error	72942.181	148	492.853				
Time	1248.294	1	1248.294	33.816	.001	.186	1.000
Time * Status	8.414	1	8.414	.228	.634	.002	.076
Error (time)	5463.253	148	36.914				

Computed using alpha = .025

As depicted in Table 16, there were significant main effects for Educational Status and Time. However, there was no significant interaction between Educational Status and Time. The various tests displayed in the table enabled the researcher to address the question of Educational Status in the academic area of math.

The mean score of Regular Education students exceeded the mean score of the Special Education students as it did with reading. The mean results for math pre-test scores are displayed pictorially in Figure 11.

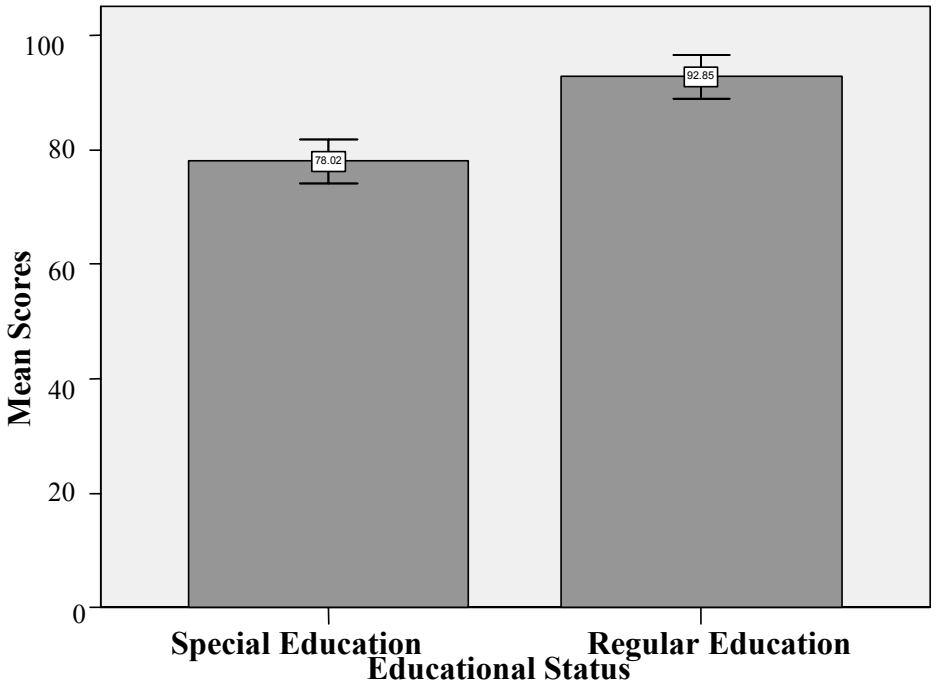

FIGURE 11. Average Math Pre-Test Scores by Educational Status

The mean scores for the math pre-test in Figure 11 depict a pattern that is similar to that of the reading pre-test mean scores. The regular education students posted a higher mean score than that of the students enrolled in special education.

The mean score for Regular Education students exceeded the mean score for the Special Education students on the post-test. The means for math post-test scores are displayed pictorially in Figure 12.

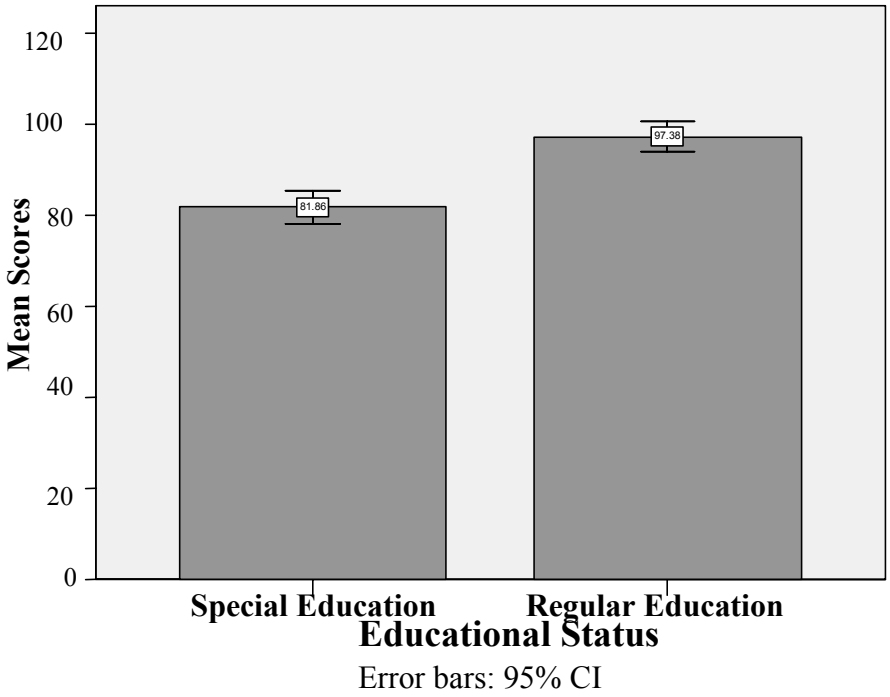

FIGURE 12. Average Math Post-Test Scores by Educational Status

The math post-test mean scores depicted in Figure 11 display that the mean scores of regular education students were higher than those of the students enrolled in special education. The pattern mimicked the results of the math pre-test.

The students in regular education and the students in special education made progress from the pre to the post-test. The results of the pre and post-math test for Educational Status are pictorially displayed in Figure 13.

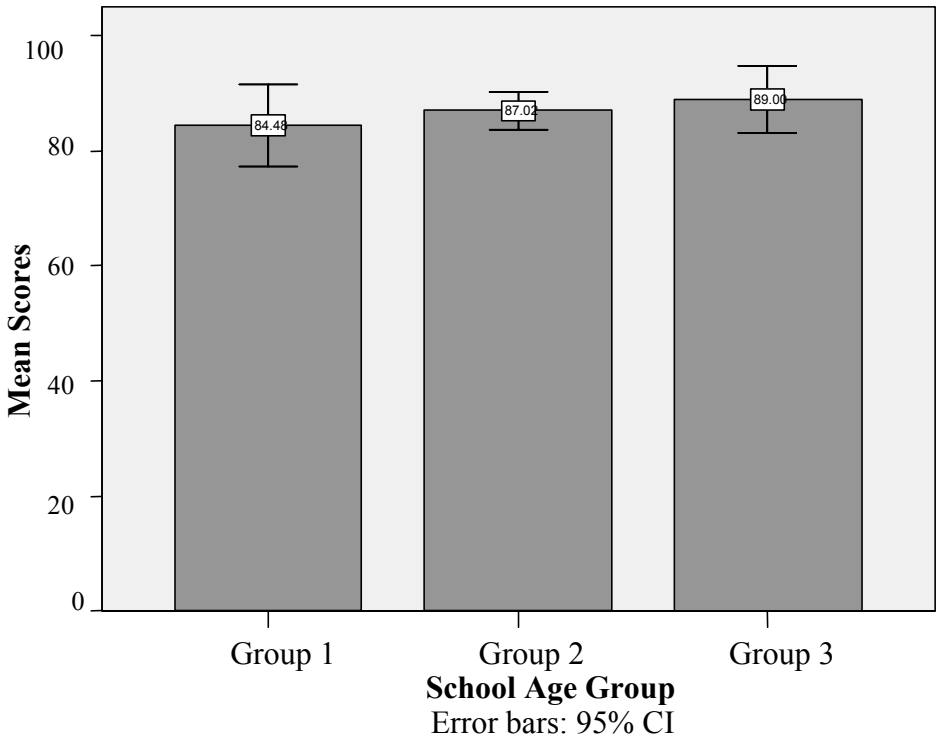

FIGURE 13. Plot for Changes in Performance from the Pre to the Post-Test Average Math Scores by Educational Status

In Figure 13, one may see that the increase from pre to post-test is almost parallel, meaning that similar gains were made by both groups of students in math. There was significance for Educational Status and Time; however, there was no significant interaction for Educational Status by Time.

More males are placed in special education programs than females. Special programs for females in mathematics have resulted in a positive difference in their

performance (Anton, 1982). In medical reports published in 1990, learning disabilities occur equally in males and females (Vogel, 1990).

Based on raw data, only 12 females students were represented in the sample of special education students. These females represented 48% of the female sample in the study. Of the total sample, 41% of students were male. There was a significant main effect for Educational Status and for Time in the area of math. There was a difference in median math scores between special education students and regular education students and there was a difference across time between pre and post-testing.

Results for Analysis of Research Question #4

Was there a significant main effect for School Age Group?

Because of the small number of students represented in the sample, some of the eighteen School Age Group cells were empty, therefore, the students were classified into three age groups. The first group was the smallest with 23 students. These students ranged in age from 10 to 12 years old. The second group had the largest membership. Ninety-two students, slightly more than 61% of the students in the sample, were contained in this group. These students ranged in age from 13 to 15 years old. Group 3 contained 35 students. These students ranged in age from 16 to 18 years old.

Reading

Data from the reading pre and post-tests for School Age Group were summarized. Descriptive data for reading for School Age Group are displayed in Table 17.

TABLE 17. Summary of the Means for Reading Pre and Post-Test Scores for School Age Group by Time

School Age Group	Time	Mean	Std. Error	Lower Limit	Upper Limit
Group 1	1	84.47	3.35	77.85	91.10
(n =23)	2	86.17	3.59	79.06	93.28
Group 2	1	87.02	1.67	83.70	90.33
(n=92)	2	87.89	1.79	84.33	91.44
Group 3	1	89.00	2.71	83.62	94.37
(n=35)	2	91.91	2.91	86.15	97.67

1= Pre-test
2= Post-test

Table 17 contains the summary of the means for both the pre and post-reading scores for School Age Group by Time. The youngest students, represented by Group 1, posted a lower mean score on the pretest than either of the other groups with a difference of 2.55 points less than Group 2 and 2.53 points less than the mean score of Group 3. The difference between Group 2 and Group 3 on the pretest was 1.98 points. The reading pretest scores for School Age Group by Time were analyzed using a 3x2 mixed model factorial with repeats on the second factor.

A 3x2 mixed model ANOVA for reading pre and post-test for School Age Group by Time was calculated. A results summary for this analysis is presented in Table 18.

TABLE 18. 3X2 Mixed Model ANOVA for School Age Group by Time for Reading Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
School Age Group	797.198	2	398.599	.767	.466	.010	.179
Error	76360.632	147	519.460				
Time	181.049	1	181.049	4.929	.028	.032	.597
Time * Age	53.673	2	26.837	.731	.483	.010	.172
Error (time)	5400.024	147	36.735				

Computed using alpha = .025

Based on the results displayed in Table 18, there was no significance for School Age Group. There was no significance shown for Time and no significant interaction for School Age Group by Time. The various tests displayed in this table enabled the researcher to address the question of School Age Group. The results for reading pre-test scores are displayed pictorially in Figure 14.

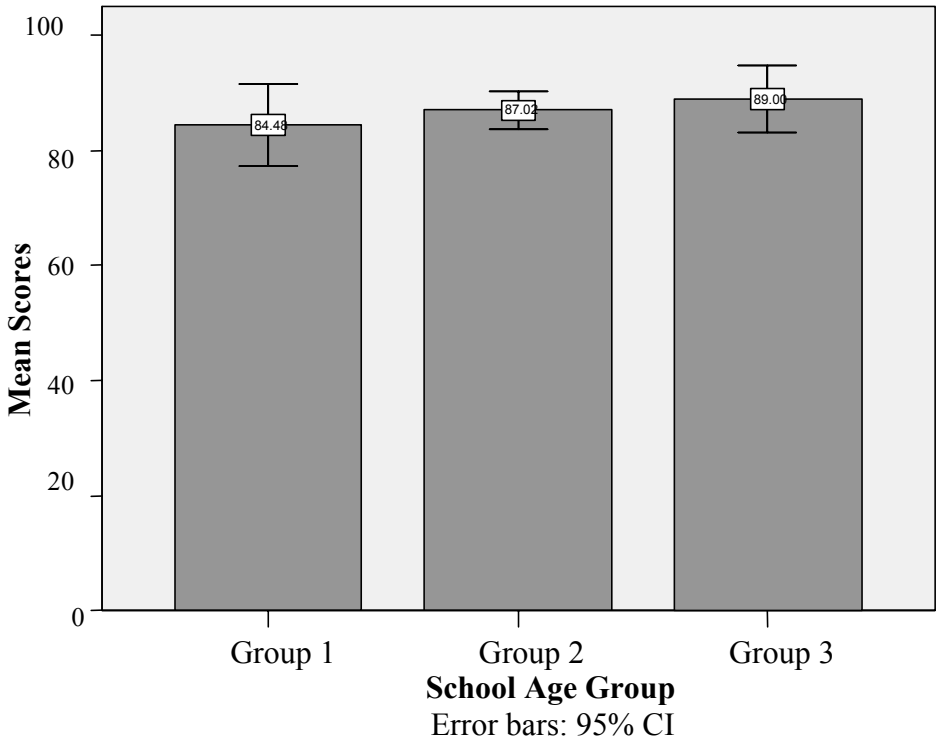

FIGURE 14. Average Reading Pre-Test Scores by School Age Group

The mean score comparison for each School Age Group is displayed in Figure 13. Group 3 students had a higher mean score than students in Group 2. In turn, students in Group 2 posted a higher mean score than students in Group 1.

The oldest group of students posted the highest mean score on the post-test. The youngest group of students posted the lowest mean score. The mean scores for all groups on the reading post-test are displayed pictorially in Figure 15.

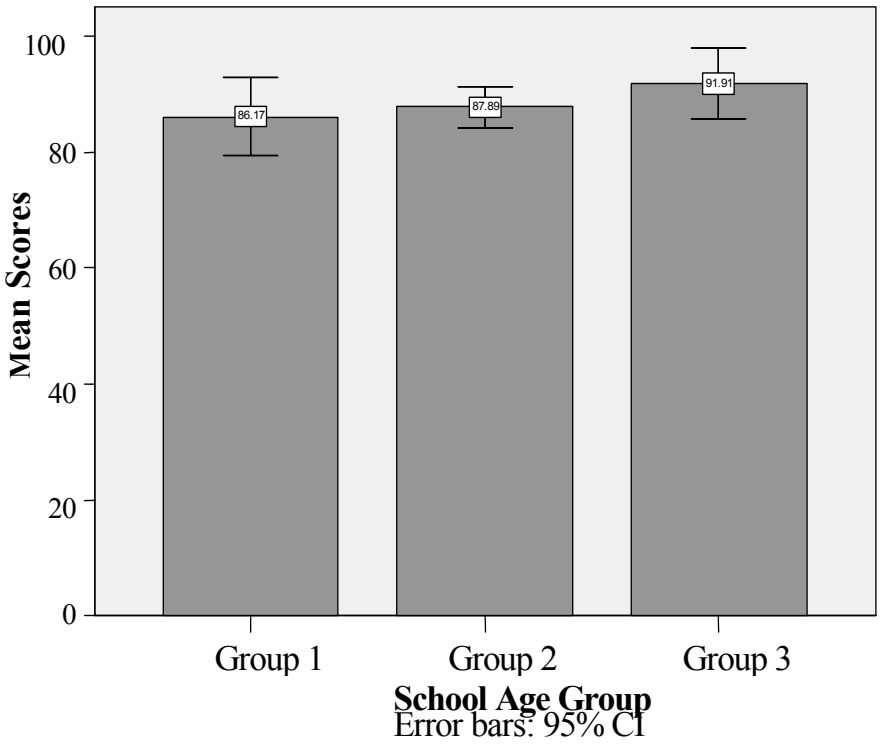

FIGURE 15. Average Reading Post-Test Scores by School Age Group

As shown in Figure 15, the results of mean scores for each School Age Group on the reading post-test are similar to those of the pre-test. Group 3 posted higher scores than Group 2. Group 2, in turn, posted higher scores than Group 1.

On the post-test, Group 1 again posted a mean score that was less than either of the other two groups. This score was 1.72 less than Group 2 and 5.74 points less than Group 3. The mean score from Group 2 on the post-test was 4.02 points lower than the mean score of Group 3 that contained the oldest students.

Group 3, the oldest group of students, showed the most growth from pre to post-test. Group 1 and 2 had similar growth patterns from pre to post-test. The results of

both the reading pre and post-test scores by School Age Group are pictorially displayed in Figure 16.

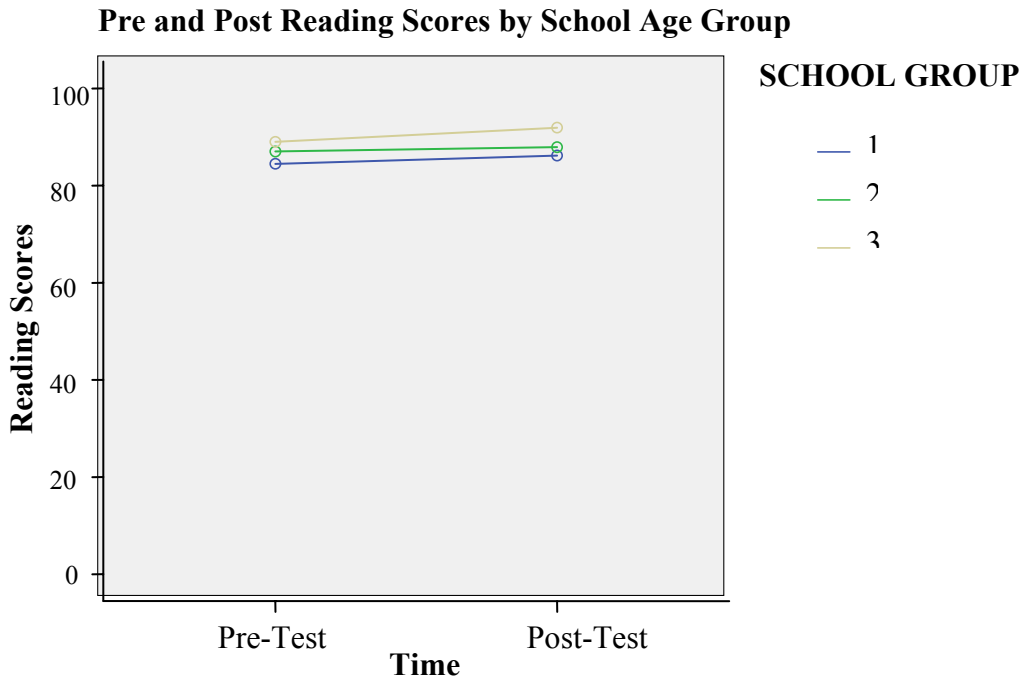

FIGURE 16. Plot For the Changes in Performance from the Pre to the Post-Test Average Reading Tests by School Age Group

Observing Figure 16, students in the oldest category and students in the youngest category had similar learning curves based on the test results. Students in the middle school range showed the least gain in overall achievement in the academic area of reading. Students in Group 3, which contained the oldest students, scored higher than the other groups on both the pre and post-tests in reading. This group showed the most gain from pre to post-test. Group 2 had the least gain from pre to post-test. Group 1, the

group with the youngest students, had the lowest pre-test scores, but showed almost as much gain on the post-test as the oldest group of students. All of these differences may be attributed to error since there was no significance shown for School Age Group, Time, or School Age Group by Time.

Although the research in this study was adjusted due to small cell size to compare students by age group rather than by gender in each age category, there is research that would support females having higher reading levels than males in all three categories. In 2001, a study was published by the Education Testing Services in which reading proficiency scores of females were higher than those of males in the fourth grade, the eighth grade, and the twelfth grade (Education Testing Services, 2001). According to G. Willis, females consistently have higher scores than males (Willis, 1995). This would correspond to Group One, Group Two, and Group Three, respectively.

Group 1, the smallest sample of students, represented only 15% of the entire sample. Group 2, the largest group of students represented 61% of the entire sample. Group 3, comprised 23% of the sample with 35 students. Based on the results of this study, there was no significant main effect for School Age Group in the area of reading. There was no difference in the reading scores for or between any of the three groups.

Math

The second section of this research question dealt with math scores. Comparisons were made across the three School Age Groups. The summary table for both math pre and post-test scores are presented in Table 19.

TABLE 19. Summary of the Means for Math Pre and Post-Test Scores for School Age Group by Time

School Age Group	Time	Mean	Std. Error	Lower Limit	Upper Limit	
Group 1	1	86.17	3.82	78.60	93.74	
(n=23)	2	91.21	3.62	84.05	98.37	
Group 2	1	86.73	1.91	82.95	90.52	
(n=92)	2	89.93	1.81	86.35	93.51	
Group 3	1	88.71	3.10	82.58	94.84	
(n=35)	2	95.28	2.93	89.48	101.09	

1= Pre-test
2= Post-test

As shown in Table 19, on the pretest, the youngest group of students had the lowest mean score, with each other group following in succession. However, on the post-test, the students in Group 2 had the lowest mean score, followed by Group1. Group 3 recorded the highest mean score for both the pre and post-test.

A 3x2 mixed model ANOVA for math pre and post-tests for School Age Group by Time was calculated. A summary of the results for this analysis is presented in Table 20.

TABLE 20. 3X2 Mixed Model ANOVA for School Age Group by Time for Math Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
School Age Group	696.899	2	348.449	.578	.562	.008	.145
Error	88627.848	147	602.911				
Time	1322.688	1	1322.688	36.555	.001	.199	1.000
Time * School Group	152.664	2	76.332	2.110	.125	.028	.428
Error (time)	5319.003	147	36.184				

Computed using alpha = .025

Observing Table 20, there was no significant main effect for School Age Group. There was a significant main effect for Time. There was no significant interaction for School Age Group by Time. The various tests displayed in the table enabled the researcher to address the question of age.

The mean scores for all three School Age Groups were similar for the pre-test. These mean scores are displayed in Figure 17.

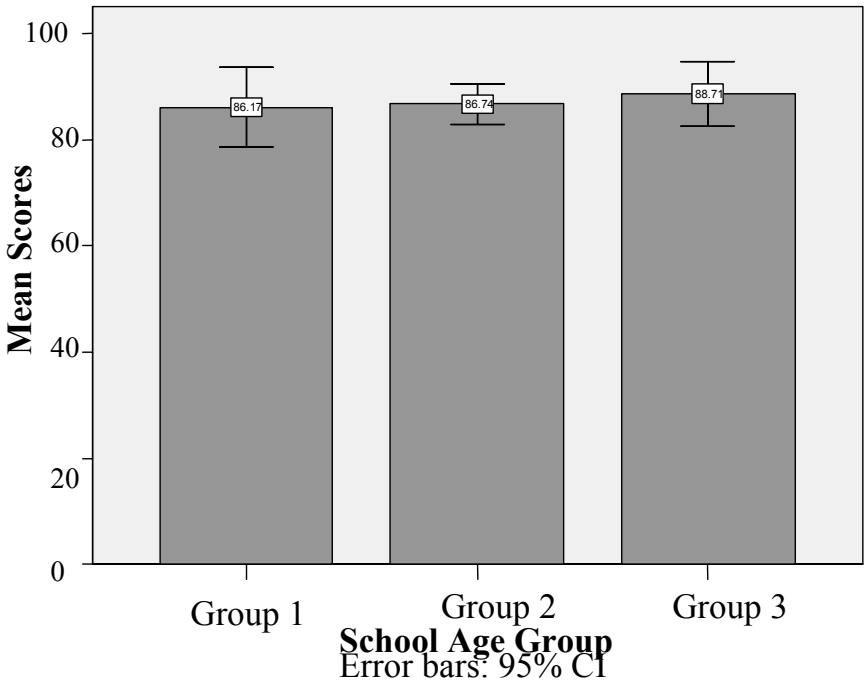

FIGURE 17. Average Math Pre-Test Scores by School Age Group

The pictorial representation in Figure 16 contains the mean math pre-test scores. The oldest students contained in School Group 3 posted mean scores that were higher than those of Group 1 and Group 2. The students in Group 2 posted mean scores that were higher than the youngest students contained in Group 1.

The youngest group of students represented in Group 1 posted a higher mean score on the post-test than the students in Group 2. As with the pre-test, the oldest group of students in Group 3 had the highest post-test mean score. The mean scores on the math post-test for School Age Group are displayed in Figure 18.

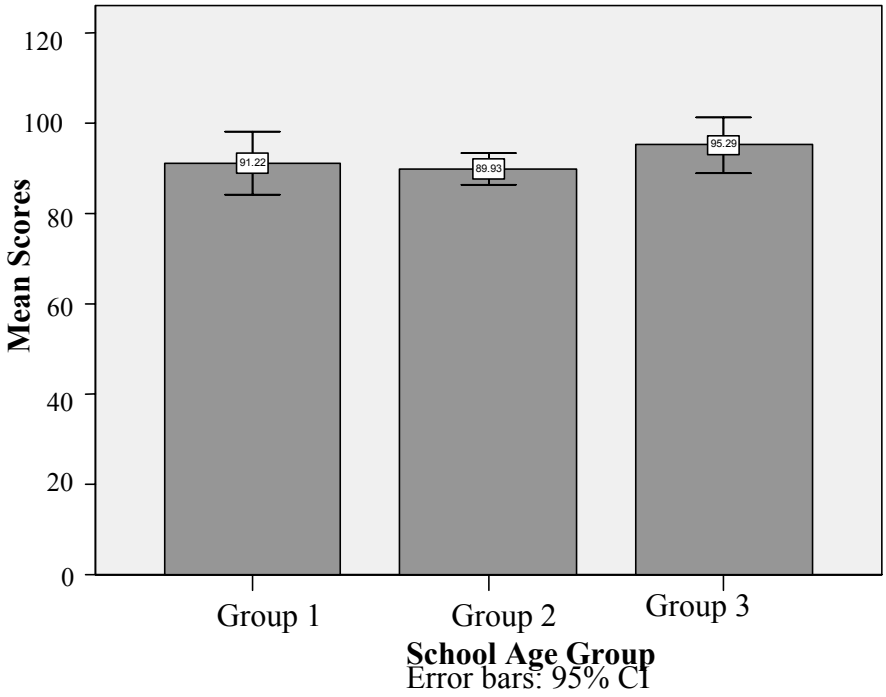

FIGURE 18. Average Math Post-Test Scores by School Age Group

The math post-test mean scores for all School Age Groups are presented in Figure 18. Students in Group 3 posted mean scores that were higher than either of the other two groups. However, Group 2 posted the lowest mean score. The youngest students in Group 1 posted a higher mean score than the older students in Group 2.

The oldest students represented in Group 3 made more progress from pre to post-test than the other two groups. The youngest group of students represented in Group 1 made slightly more progress than Group 2 across time. A pictorial representation of reading pre and post-test scores by School Age Group is presented in Figure 19.

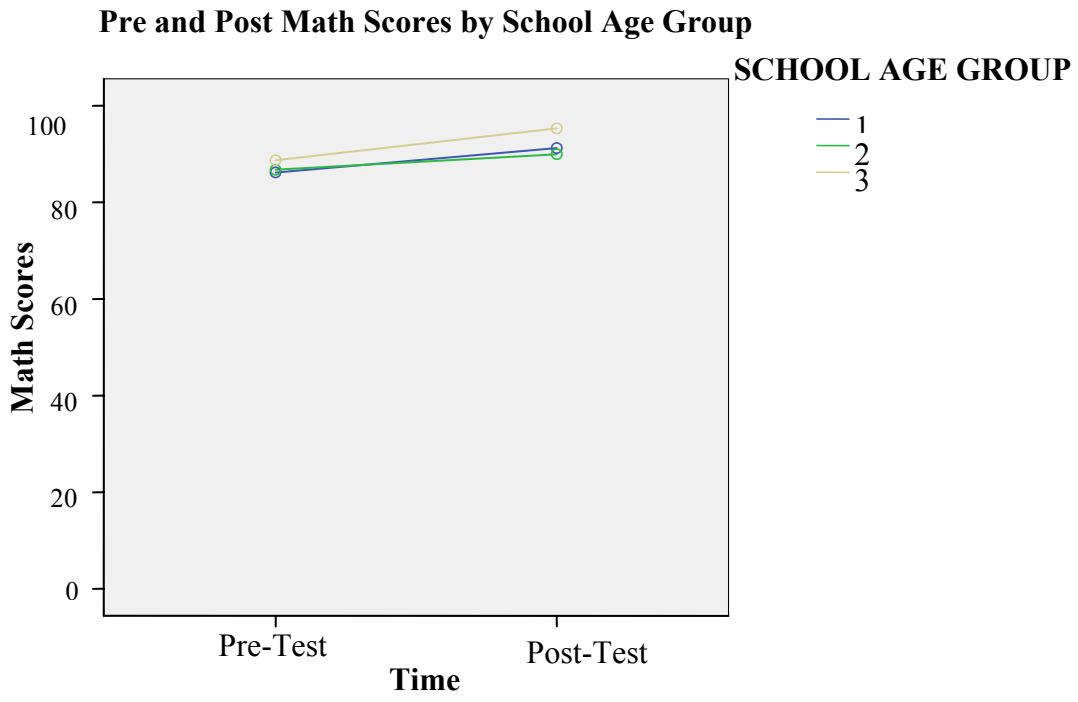

FIGURE 19. Plot for Changes in Performance from the Pre to the Post-Test Average Math Test Scores by School Age Group

The youngest group of students, Group 1, posted the lowest means, however, their post-test knowledge exceeded that for the middle school students represented as Group 2 as viewed in Figure 18. The pattern is similar to that seen in the plot for reading performance data. The students in Group 3, which contained the oldest students, scored higher on both the pre-test and the post-test than either of the other two groups. The middle school students in Group 2 scored better on the pre-test than Group 1, however, they did not make as much gain on the post-test as the younger students. While there was significance shown for Time, there was no significance for School Age Group. There was no significant interaction for School Age Group by Time.

Math performance comprises a large portion of single-gender research. There are no differences in elementary school. However, the differences begin to occur in grade seven and continue through grade twelve (Willis, 1995). Group 1 students, the youngest and 15% of the sample, increased median math scores from pre to post-testing by a greater margin than the students in Group 2, who made the least increase from pre to post-testing. However, contrary to the performance in reading, the median math scores of the oldest students in Group 3, 23% of the sample, increased the most from pre to post-testing.

Based on the data in this research, there was no significant main effect for School Age Group in math. This means that there was no difference in the median math scores of the three groups. However, there was significance for Time, meaning that all students made progress from pre to post-testing in the area of math.

Results for Analysis of Research Question #5

Was there a significant main effect for Ethnicity?

White students represented slightly more than 31% of the sample with 46 students. The African American students totaled 71, representing 46% of the total number of students. Hispanic students comprised the smallest number of students with a total of 33, representing 22% of the total students.

Reading

Data from reading the pre and post-test for Ethnicity was compared across Time. Descriptive data for mean reading pre and post-test scores for ethnicity are displayed in Table 21.

TABLE 21. Summary of the Means for Pre and Post-Test Reading Scores for Ethnicity by Time

Ethnicity	Time	Mean	Std. Error	Lower Limit	Upper Limit
African American	1	82.42	1.78	78.91	85.94
(n=71)	2	84.28	1.92	80.48	88.08
Hispanic	1	84.03	2.59	78.90	89.15
(n=33)	2	83.97	2.79	78.44	89.49
White	1	96.19	2.17	91.89	100.48
(n=46)	2	98.17	2.34	93.53	102.80

1= Pre-test
2= Post-test

Table 21 contains data for Ethnicity by Time. White students posted a mean score that was higher on both the pre and post-tests than the other two ethnic groups. African American students posted the lowest mean score on the pre-test. Hispanic students posted the lowest mean score on the post-test.

Results for reading scores for Ethnicity by Time were analyzed using a 3x2 mixed model factorial with repeats on the second factor. A summary of the results of the statistical analysis for reading pre and post-test scores by Ethnic Groups is presented in Table 22.

TABLE 22. 3X2 Mixed Model ANOVA for Ethnicity by Time for Reading Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
Ethnicity	11988.262	2	5994.131	13.521	.001	.155	.998
Error	65169.568	147	443.330				
Time	108.195	1	108.195	2.943	.088	.020	.399
Time * Ethnicity	49.982	2	24.991	.680	.508	.009	.163
Error (time)	5403.714	147	36.760				

Computed using alpha = .025

Observing Table 22, there was a significant main effect for Ethnicity, no significant main effect for Time, and no significant interaction for Ethnicity by Time. White students posted a mean score on the pre-test that was 12.16 points higher than the Hispanic students. The mean score for African American students on the pre-test was the lowest of the three ethnic groups. The mean scores on the reading pre-test are displayed in Figure 20.

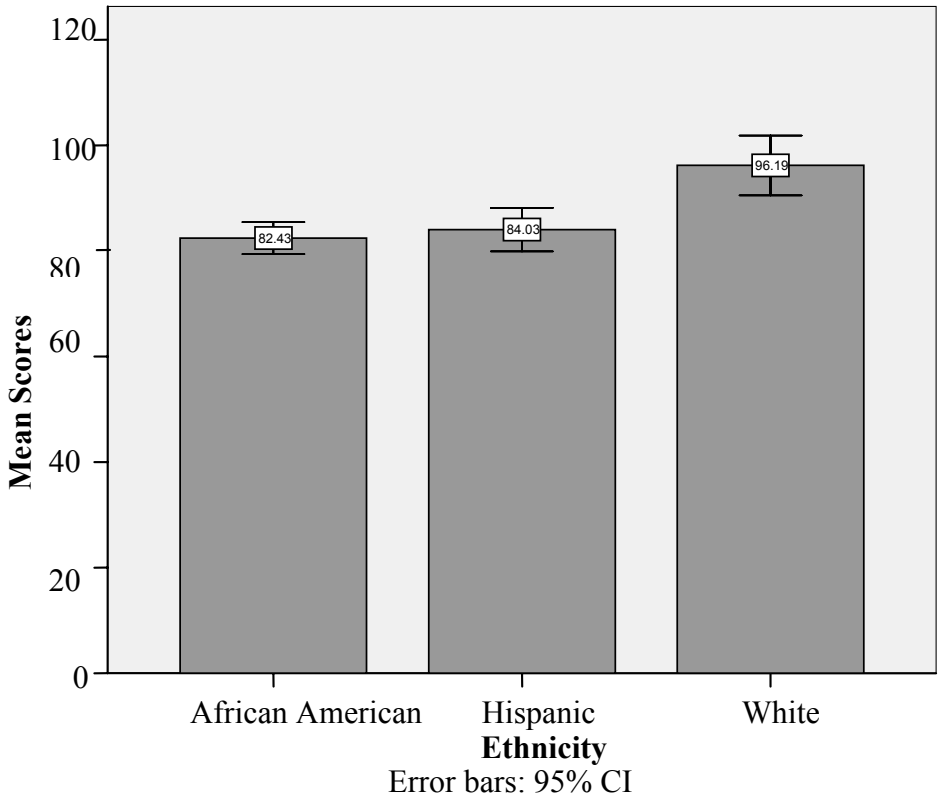

FIGURE 20. Average Reading Pre-Test Scores by Ethnicity

In Figure 20, the mean reading scores of the White students was greater than those of the other two ethnic groups. Hispanic students posted a mean score that was higher than that of the African American students.

As with the pre-test, the White students posted the highest mean score on the reading post-test. However, the Hispanic students posted the lowest mean score. The results for reading post-test scores are displayed pictorially in Figure 21.

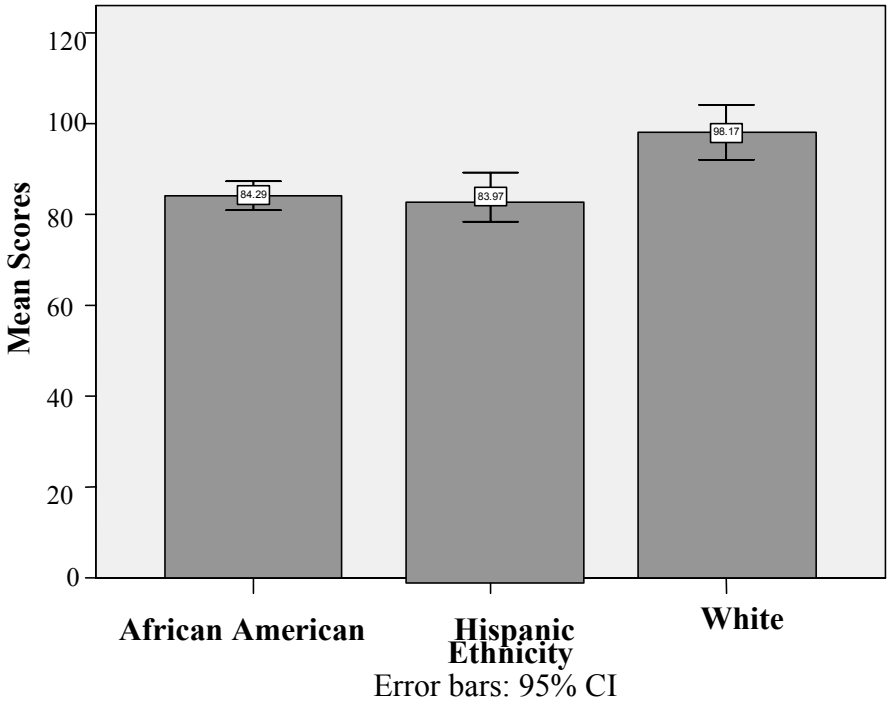

FIGURE 21. Average Reading Post-Test Scores by Ethnicity

The mean score for the White students was higher on the post-test for reading than that of either of the other two groups as shown in Figure 21. The Hispanic and the African American students posted similar mean scores for the reading post-test.

Changes in performance from pre to post-test in reading for the three ethnic groups are pictorially displayed in Figure 22.

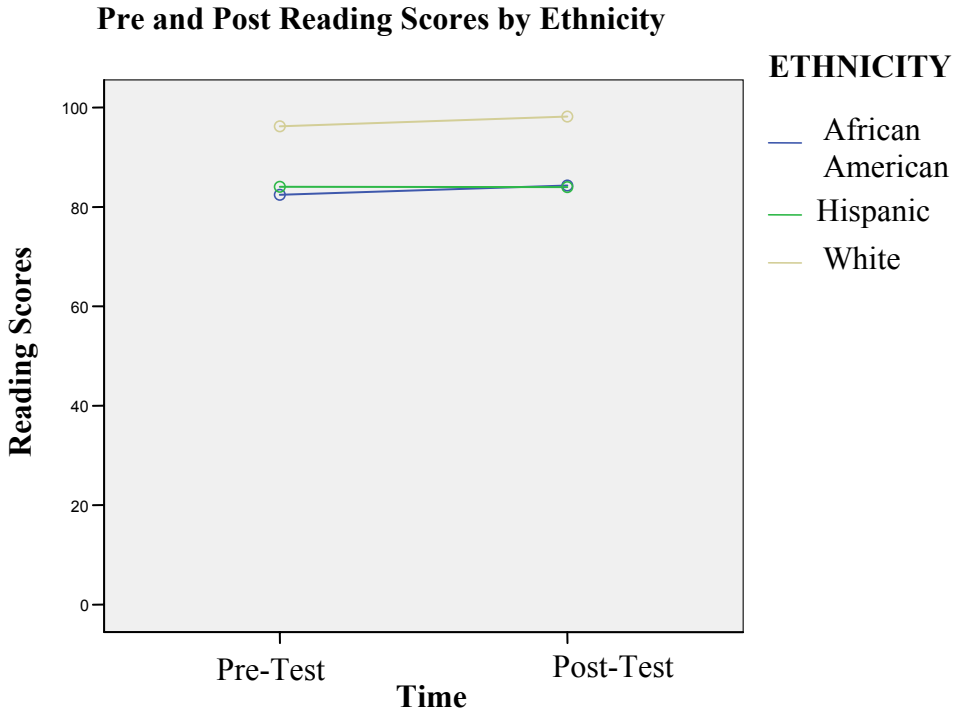

FIGURE 22. Plot for Changes in Performance from the Pre to the Post-Test Average Reading Scores by Ethnicity

White students averaged higher than the other ethnic groups on both the reading pre and post-tests as shown in Figure 21. African American students scored lower on the reading pre-test than the other two groups. However, their post-test scores were slightly higher than those of Hispanic students. The Hispanic students showed little improvement from pre to post-test in reading. There was significance for Ethnicity. Because of this significant main effect and no interaction of Ethnicity by Time, the Ryan-Einot-Gabriel-Welsch Post Hoc test was conducted for reading across the three ethnic groups. A summary of the post hoc results is presented in the Table 23.

TABLE 23. Ryan-Einot-Gabriel-Welsch Post Hoc Test for Reading by Ethnicity

		Subset	
Ethnicity	N	1	2
African American	71	83.36	
Hispanic	33	84.00	
White	46		97.18

Note: Groups in the same subset are not different from each other.

Based on the results of the post hoc test, there was statistical significance in mean reading scores based on Ethnicity as listed in Table 23. White students scored significantly higher than the other two groups and the other two groups were not significantly different from each other.

Based on testing data, African American and Hispanic students are approximately four years behind White student in reading by Grade 12 (National Governor's Association Center for Best Practices, 2006). In this body of research, the median reading scores of both African American and Hispanic students were behind those of the White students.

There was unequal representation of each ethnic group in the testing sample. African American students comprised 47% of the sample, with 27% of those students being female and 73% being male. Hispanic students comprised 22% of the sample, with females comprising 21% of the ethnic groups and males comprising 79%. White students comprised 31% of the sample, with 24% of the ethnic group represented by females and 76% represented by males.

Based on the results of this study, there was a significant main effect found for Ethnicity in reading. This means that there was a difference in mean reading scores for

one or more of the ethnic groups. After further testing, this significant was for White students only. The other two ethnic groups were not different from each other.

Math

Descriptive data for math pre and post-test scores by Ethnicity are presented in Table 24. African American students comprised the largest portion of the sample while Hispanics made up the smallest portion of the sample. White students comprised less than one-third of the sample tested.

TABLE 24. Summary of the Means for Math Pre and Post-Test Scores for Ethnicity by Time

Ethnicity	Time	Mean	Std. Error	Lower Limit	Upper Limit
African American (n=23)	1	84.57	2.12	80.37	88.77
	2	87.20	1.99	83.26	91.13
Hispanic (n=92)	1	82.84	3.09	76.73	88.96
	2	89.18	2.90	83.44	94.91
White (n= 35)	1	93.89	2.59	88.76	99.01
	2	99.14	2.43	94.34	103.95

1= Pre-test
2= Post-test

The Hispanic students had the lowest mean score on the pre-test as shown in Table 24. This score was 1.73 points lower than the mean score of the African American students and 11.05 points lower than the mean score of the White students.

On the post-test, the African American students had the lowest mean score. This score was 1.98 points lower than the mean score of the Hispanic students and 11.94 points lower than the mean score of the White students. This test was administered on the last day of enrollment for each student.

A 3x2 mixed model ANOVA for math pre and post-test for Ethnicity by Time was calculated. Results for the statistical analysis of scores for Ethnicity are presented in Table 25.

TABLE 25. 3X2 Mixed Model ANOVA for Ethnicity by Time Math Scores

Source	Sum of Squares	df	Mean Square	F	p	Partial Eta Squared	Observed Power(a)
Ethnicity	7245.133	2	3622.566	6.488	.002	.081	.901
Error	82079.614	147	558.365				
Time	1534.414	1	1534.414	42.685	.001	.225	1.000
Time * Ethnicity	187.360	2	93.680	2.606	.077	.034	.513
Error(time)	5284.306	147	35.948				

Computed using alpha = .025

Observing Table 25, there was significance for Ethnicity. There was significance for Time, but no significant interaction for Ethnicity by Time. The various tests displayed in the table enabled the researcher to address the question of ethnicity for the academic area of math.

As with the reading tests, the White students posted the highest mean score on the math pre-test. The African American students had a mean slightly higher than that of the Hispanic students. The mean scores are pictorially displayed in Figure 23.

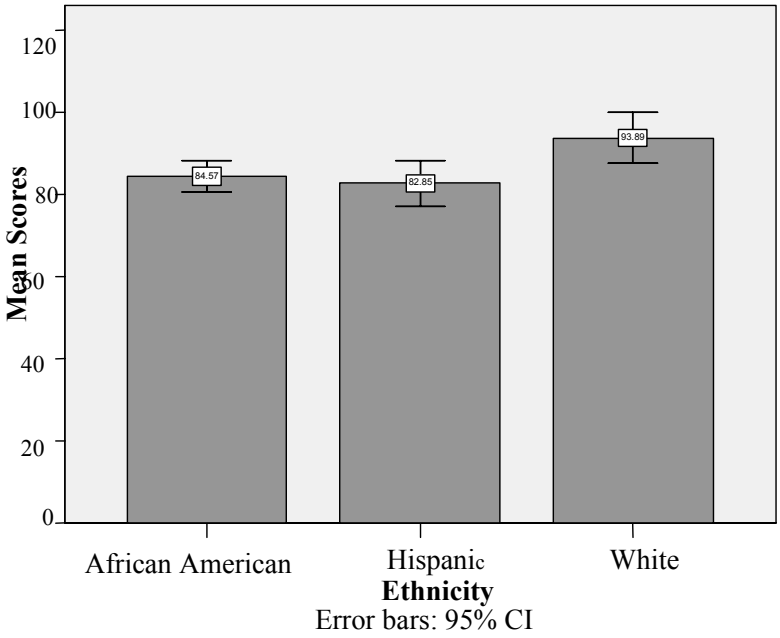

FIGURE 23. Average Math Pre-Test Scores by Ethnicity

As depicted in Figure 23, the White students posted a higher mean score on the math pre-test than either of the other two ethnic groups. The mean score of the African American students was higher than that of the Hispanic students. This test was administered to each student on his or her initial day of enrollment.

The post-test results were similar to those of the pre-test. White students again posted the highest mean score followed by African American students. The results of the mean math post-test scores are depicted in Figure 24.

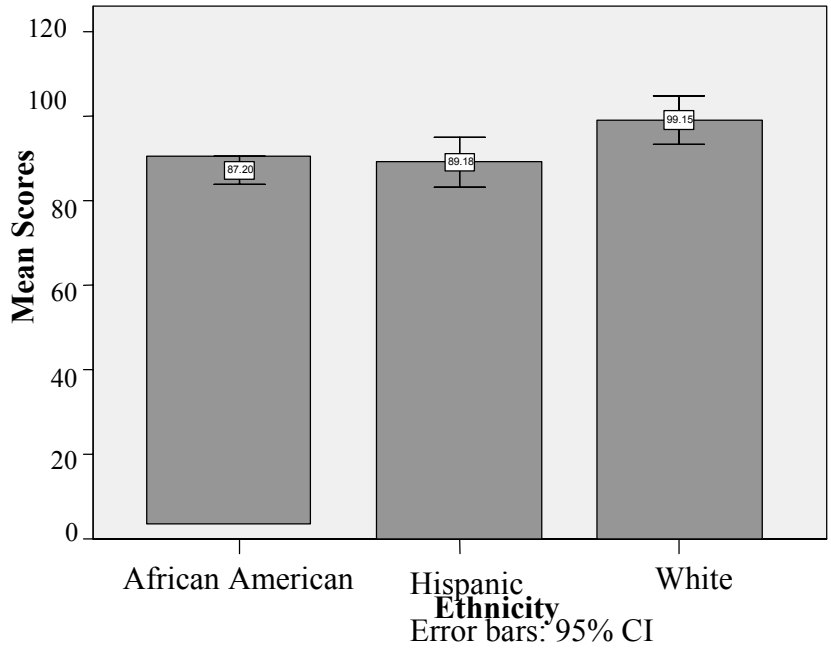

FIGURE 24. Average Math Post-Test Scores by Ethnicity

As depicted in Figure 24, the mean score of the White students on the math post-test was higher than the mean score of either of the other two ethnic groups. The Hispanic students had a mean score of 89.18, which was lower than that of the African American students. This test was administered on the final day of each student's enrollment.

The White students progressed in a parallel pattern to the other two groups. However, the African American students did not show as much growth as the other two Ethnic groups. A pictorial representation of math pre and post-test scores by ethnic group is displayed in Figure 25.

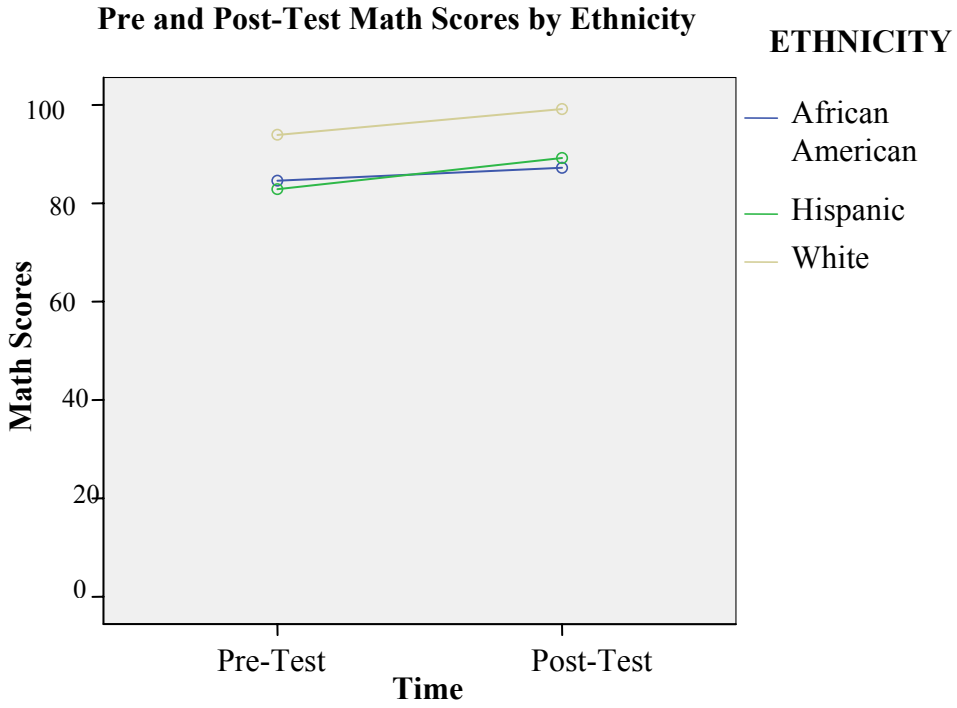

FIGURE 25. Plot for Changes in Performance from the Pre to the Post-Test Average Math Scores by Ethnicity

The African American students scored higher than the Hispanic students on the pre-test, however, they made less gain on the post-test as shown in Figure 25. The rate of growth from pre to post-test for African American students increased the least. Hispanic students had the lowest score on the pre-test; however, they scored higher than the African American students on the math post-test. White students scored higher than the other two ethnic groups on both the math pre and post-tests. Because there was a significant difference for Ethnicity, post hoc testing was conducted. The results are displayed in Table 26.

TABLE 26. Ryan-Einot-Gabriel-Welsch Post Hoc Test for Math by Ethnicity

School Group	N	Subset 1	2
African American	71	85.89	
Hispanic	33	86.02	
White	46		96.52

Note: Groups in the same subset are not different for each other.

Based on the results in Table 26, there was a statistically significant difference in math scores for the White students only. There was no statistical difference for African American or Hispanic students in the sample.

The African American median math scores increased the least between pre and post-test with a difference of 2.63 points. This data is aligned with the research in 1992 in which American females scored higher than males in math in the fourth and eighth grades and were only behind by 0.2 points in the twelfth grade (Donahue, 1999). Less progress was made in the upper grades.

The median math scores for Hispanic students had the highest increase, 6.34 points, between pre and post-test supporting. This would support strong scores for the group. Hispanic females outscored the males in all three grade levels tested in a 1992 study (Donahue, 1999).

The median math scores for White students increased by 5.25 points between pre and post testing. White males outscored females in math in the fourth and twelfth grades, but were lagged behind the females in eighth grade (Donahue, 1999). This indicates a slower rate of progress by the upper grades for White students.

Based on the results of this study, there was a significant main Ethnicity in the area of math. This means that there was a difference in mean math scores for one or more of the ethnic groups. However, after further testing, this significance was for White students only. The scores of the other two ethnic groups were not different from each other.

There also was significance for Ethnicity by Time in the area of math. This means that the mean scores of one or more of the ethnic groups increased significantly across time. This difference was for White students only.

Results for Analysis of Research Question #6

Were there any significant 2 factor interactions for Time and Gender, Educational Status, School Age Group, and Ethnicity?

This question was answered in the mixed model ANOVA tables in each of the previous sections. There was no significant interaction for Gender by Time, Educational Status by Time, School Age Group by Time, or Ethnicity by Time for either of the dependent variables of reading or math.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter V contains a summary of the purpose, methodology and major findings resulting from the research study. Conclusions are based on results of the data analyses and recommendations are made for further research.

Introduction

Single-gender schools were common in the nineteenth century. Schools for females, however, did not include academic subjects that would lead girls on to higher education. Because of this inequity, early feminists urged that schools be co-educational, giving all students access to an equal education. The only exception was physical education classes. In 1975, the provisions of Title IX specifically banned single-gender physical education classes (Tyack & Hansot, 1990). School district personnel misunderstood this ruling and interpreted it as a ban on all single-gender classes. Coeducational classes became the norm for public schools across the country.

Over the past twenty years, policy makers have noted declines in educational achievement among boys and girls. Researchers do not agree as to whether or not a return to single-gender classes would increase achievement. They do, however, agree that the middle school years are crucial to forming sound educational habits (Clewell, Anderson & Thorpe, 1992). The American Association of University Women endorsed single-gender classes as a means to promoting female achievement and, later, reversed their position fearing that single-gender classes could lead to programming decisions that discriminated against females. Conversely, some researchers believe that single-gender

classes are advantageous for boys who are behind in the areas of reading and writing (Sommers, 2001).

In 2004, President George W. Bush proposed changes to Title IX that would encourage the creation of single-gender schools and classes. David Sadker and Karen Zittleman believe that this proposal ignores sound education policy based on scientific evidence and research. The success of this form of education in private schools is largely attributed to smaller class sizes, engaged parents, and coupled with well-trained staff and a strong emphasis on academic success. The effectiveness of single-gender education in public schools has not been carefully studied (Sadker & Sadker, 1984).

California Governor Pete Wilson used single-gender schooling as a quick fix for educational problems in his state's schools. He even provided extra funding for school districts that were willing to participate in an experiment that did not include planning and evaluation components. Roughly six school districts chose to participate. Anecdotal reports stated that girls enjoyed being in an environment free of sexual harassment and class interruptions while the boys' schools degenerated into magnets for troubled youth because of disciplinary problems (Sadker & Sadker, 1984).

Opponents of this new proposal being implemented without careful planning and evaluation believe that Title IX is not an educational option, but, more importantly, a civil rights protection. The new proposal, as it is currently stated, does not require equal treatment or equal facilities. A school could provide a single-gender option for boys and not for girls. The proposed changes could promote gender segregation putting thirty

years of civil rights protections at risk and becoming a prescription for disaster (Sadker & Sadker, 1984).

Summary

Purpose of the Study

The primary purpose of this study was to determine the effect on reading and math scores of females and males segregated into single-gender classrooms. Six research questions were addressed:

1. Was there a significant main effect for Gender?
2. Was there a significant main effect for Time?
3. Was there a significant main effect for Educational Status?
4. Was there a significant main effect for School Age Group?
5. Was there a significant main effect for Ethnicity?
6. Were there any significant 2-factor interactions between time and each of the independent variables of Gender, Educational Status, School Age Group, and Ethnicity?

Methodology

The data for this research study included pre and post-test scores in the areas of reading and math collected at the time of student enrollment and exit. During the 180-day period of time between pre and post-testing, the students received instruction in single-gender classrooms with self-paced, individualized curriculum.

The test data were rated on a computer program (Kaufman, 1998) that generated grade equivalents. No other additional dependent variable data were collected from students or staff members, but were retrieved from archival records compiled by the

participating school. Permission for testing was received from parents upon enrollment and written permission was given by the program director to access the data files located in the school office.

Summary of Findings

Research Question #1

Was there a significant main effect for Gender?

Reading

Reading scores were analyzed for gender. Pre-test scores were obtained on the first day of placement and post-test scores were obtained on the final day of placement. The male pre-test mean score was 0.09 points higher than the mean score of the females. The mean score for males increased by 1.l77 points while that of the females increased by only 0.57 points. This would imply that the males derived more benefit from receiving instruction in an individualized, self-paced curriculum in a single-gender classroom. However, statistically, the evidence suggested this was not true. There were no significant differences.

The data were analyzed with both between and within subject tests. No post hoc test was conducted for Gender or for Time because there were only two levels. All tests of significance were conducted using a .025 alpha level.

While segregating students by gender did not make a statistically significant difference in the improvement of reading scores for either males or females, there was an average increase in skills for both genders. This increase, however, could have been by chance. The curriculum was tailored to the individual needs of all students; therefore,

the students did not have "gaps" in their learning that are typically found when all students are taught the same material at the same pace. Also, discipline was improved because students were not singled out or called on in class to answer questions orally. No one had to "save face" by acting out when they were unable to answer a question.

There was improved performance for both genders over the 180-day term of placement. However, after statistical testing this improvement was not as great as the researcher had anticipated. There was no significance found for Gender, for Time, and no significant interaction for Gender by Time in the area of reading. This means that the researcher could not make any conclusions regarding the reading improvement of either gender.

These research findings are contradictory to the results of a study conducted from 1992 through 1998 by the National Assessment of Education Progress. In that study, females scored higher than males in the fourth, eighth, and twelfth grades (Willis, 1995). The research reported by Willis was supported by research reported in 2001 by the Education Testing Services in which females, again, had higher average reading scores than males (Education Testing Services, 2001). On the basis of these studies, the researcher expected to have statistical evidence of higher reading scores for female students. In this study, there was no statistically significant difference between the scores of females and males.

While seeking an explanation for the results shown in this study, the researcher must consider the fact that males outnumbered females in this study by a ratio of nearly

four to one. The disproportionate sample size would have impacted the outcome of the study. With equal representation, the results may have been different.

Myra and David Sadker would attribute this non-significant difference between females and males in reading scores to their research published in 1984. They presented evidence that females enter school scoring ahead of males, and leave school scoring behind males. This deficit in the learning curve would occur slowly over a twelve year period (Sadker & Sadker, 1984).

Math

The results of the math pre and post-test closely mimicked those of the reading tests. The females mean scores were slightly higher than those of the males. The difference was small and not statistically significant.

Both groups made progress over the 180-day term of placement. The difference across time was statistically significant. However, there was not significant interaction between Gender and Time. In research published in 1995, Willis stated that females and males are equal in math performance when they begin school. The differences increase at grade seven and, by twelfth grade, the achievement levels of males are higher than females in math (Willis, 1995).

As with the area of reading, the results of this study contradict prior research in which males were more proficient in math than females. The difference was significantly different by the twelfth grade (Willis, 1995). In 2001, the Education Testing Services reported a study in which there was no difference between females and males in math (Education Testing Service, 2001).

This section of the research question should have been greatly impacted by the fact that males outnumbered females by 68%. This should have supported the research by the Education Testing Service that was reported in 2001.

Research Question #2

Was there a significant main effect for Time?

There was significance for time in the following areas: Gender in math, Educational Status in reading and math, School Age Group in reading and math, and Ethnicity in reading and math. There was significance found for Time in math scores for Gender, for Educational Status, and for School Age Group. There was no significance found for Time in the area of reading.

Research Question #3

Was there a significant main effect for Educational Status?

Reading

Due to inadequate numbers of students who were both pre and post-tested, the cell sizes were not large enough to compare female regular education students to female special education students. Therefore, the researcher was forced to modify the question and compare regular education students to special education students. There were 58 students enrolled in special education programs and 72 students enrolled in regular education programs.

The difference in mean reading scores for the pre-test was 13.76 with regular education students posting the highest mean score. On the post-test, the difference increased to 13.99 points.

Special education students scored lowest in reading on both the pre and post-test. This result was not unexpected by the researcher. In order to qualify for special education, there must be a sixteen-point discrepancy between the student's IQ and their functional level. Therefore, one would expect that these students would score lower than their regular education counterparts.

The data for special education versus regular education students were analyzed for both between and within subjects. No post hoc test was conducted because there were only two levels. All tests of significance were conducted using a .025 alpha level.

There was a statistically significant difference found for Educational Status in reading scores of special education versus regular education students enrolled in the single-gender, self-paced program. However, there was no significance for Time nor any significant interaction for Educational Status by Time in reading. Based on the data available, having the special education students in separate classrooms did not make a difference in the gains that were made in reading during the term of placement for regular education students.

The results reported in this study may reflect the skew in referrals to special education programs in which males far outnumber females (Salomone, 2003). This contradicts the medical research published in 1990, which reported that learning disabilities occurred with females and males in equal numbers (Vogel, 1990). If this was the case, the students who displayed learning disabilities were not segregated into the two groups with fidelity. Students who were not identified as special education, but who

in fact were learning disabled, were represented in the sample of regular education students. This would support the research by Salomone and Vogel (Vogel, 1990).

Math

As with the mean reading scores, the regular education students posted higher mean scores for both the pre and post-tests in math. The difference on the pre-test was 14.83 points on the pretest and 15.52 points on the post-test.

This result was not unexpected. Students qualify for special education programs due to the discrepancy between their ability and their performance. Typically, this is a sixteen-point difference. Therefore, one would expect special education students to have lower scores than their counterparts in regular education programs. There were benefits experienced by both groups of students after receiving individualized self-paced instruction in a single gender classroom, such as increased self-confidence in their academic abilities and the ability to move from one grade level to the next when work was completed rather than when the academic year was over.

Based on the results, there was significance for Educational Status and for Time between the pre and post-test math scores for special education versus regular education students enrolled in the single-gender, self-paced program. There was no significant interaction for Educational Status by Time in the area of math. There was significance for Educational Status across time in reading and math. All students in the sample achieved significant gains during their term of placement. As with the reading test, there were too few students in each cell to compare females and males with validity. Students were compared solely on their classification as special education and regular education.

While rarely focusing on the issue of gender in special education, the American Association of University Women found that referrals to special education are higher for males than for females even though medical reports indicated that learning disabilities occur equally in males and females. Because females were identified with less frequency, they were deprived of the specialized services to reach their full potential (American Association of University Women, 1992).

Upon reference to the raw data, 39% of the sample was identified as being members of this group. Of those 58 students, 12, or 21%, were females. Based on the aforementioned study by the American Association of University Women, females were under-represented in the special education group. The research could not make statistical conclusions regarding female performance versus male performance in either the special education group or the regular education group.

Research Question #4

Was there a significant main effect for School Age Group?

Due to the small number of students who were both pre and post-tested, the cell sizes were not large enough to compare female students to male students in each age group. The students were divided into three categories. Group 1 was composed of 23 students ranging from 10 to 12 years of age. Group 2 was composed of 92 students ranging from 13 to 15 years of age. Group 3 was made up of 35 students ranging from 16 to 18 years of age. Again, the researcher was forced to modify the question and compare age groups to each other.

Reading

The youngest group had the lowest reading mean scores both before and after treatment. The difference between pre and post-test scores was 1.70 points. The middle group had the second highest mean scores on both the pre and pos-tests. The difference between treatments was 0.87 points. The oldest group of students comprising Group 3 had the highest mean scores on both the pre and post-tests. The difference between these scores was 2.92 points.

These results might lead one to believe that Group 3, the oldest group of students benefited more from receiving reading instruction with an individualized self-paced curriculum in a single gender classroom. Statistically, the sample evidence suggests that this is not true. There was no significance for School Age Group, no significance for Time, nor any significant interaction for School Age Group by Time.

With regard to this study, the researcher was unable to conclusively support research findings in which George Willis found that females outscored males consistently in reading (Willis, 1995). This research was further supported in 2001 by research in which females exhibited higher average reading levels than the males (Education Testing Service, 2001). With the unequal distribution of females and males coupled with the unequal numbers in each School Age Group, the results of this study would not have been a fair and equal representation of gender in any of the three separate age groups.

Math

Group 1, the youngest group posted the lowest pre and post-test scores in math just as they did in reading. The difference was 5.04 points. Group 2 posted the second highest scores with the difference between pre and post-test mean scores being 3.20 points. The oldest students, Group 3, had the highest mean scores on both the pre and post-test. The difference between the two was 6.57 points. As with the reading, the oldest group posted the greatest gains.

While there was a difference between scores in both the pre and post-tests in math, this difference was not statistically significant for School Age Group. There was significance for Time in the area of math for students enrolled in the single-gender, self-paced program.

The students in Group 2 had the least increase in reading scores from pre to post-test. Again, in math, the results were the same. This is the 10 to 12-year-old group. Typically, these students are fifth to seventh grade. Willis conducted research in which the differences between females and males in math performance increase negatively for the females in or around seventh grade (Willis, 1995). These results would not necessarily support his conclusions females in because only 28 of the 92 students in this group were female. This comprised 30% of the sample.

As with the reading portion of this research question, unequal numbers of females and males were reported in the study as well as unequal numbers of students in each School Age Group category did not allow the research to conclude that this study supported prior research. Donahue reported that males outscored math in grades four

and twelve with females holding a slight edge in eighth grade (Donahue, Voelkl & Campbell, 1999). Because there were 68% more males in this study than females the results were impacted by the over-representation of males in each category.

Research Question #5

Was there a significant main effect for Ethnicity?

Student's scores were analyzed according to the ethnic data collected at the time of intake. Three groups were represented. Hispanic students numbered 33, or 22% of the sample. There were 70 African American students 46.7% of the students tested and 47 White students representing 31.3% of the students in this study. Due to the small number of students who were both pre and post-tested, the cell sizes were not large enough to compare female students in each ethnic group to male students in each ethnic group. Ethnic groups were compared to each other in the areas of reading and math.

Reading

The African American students posted the lowest pre-test mean score in reading. Hispanic students whose mean score was 1.60 points higher comprised the middle group. The White students posted a mean score on the pre-test that was 13.76 points higher than that of the African American students and 12.16 points higher than the mean pre-test score of the Hispanic students.

The difference in pre and post-test scores for Hispanic students dropped by 0.06 points. The difference for African American students was a net gain of 1.86 points. The White students had a gain of 1.98 points.

The reading data for the students represented in each ethnic group were analyzed for both between and within subject tests. A post hoc test was conducted because there were three levels. All tests of significance were conducted using a .025 alpha level. Based on the results of this testing, there was statistical significance for Ethnicity, but not for Time or Ethnicity by Time in the area of reading.

Research reported in 2006 supported the findings of this study. Both African American and Hispanic students were almost four years behind White student in reading by the twelfth grade (National Governor's Association Center for Best Practices, 2006). The samples sizes in this study were unequal with 47% being African American, 22% being Hispanic, and 31% being White. The two minority groups comprising 69% of the sample, had lower average reading scores than the White students.

Math

The Hispanic students had the lowest mean pre-test score in math, however, the post-test score for this group was 1.98 points higher than that of the students in the African American group. The difference between pre and post-test mean scores for the Hispanic students was 6.33 points.

The African American students posted a mean pre-test that was higher than the Hispanic students, but lower than the White students. The difference between their pre and post-test scores was 2.63 points. The White students posted the highest pre and post-test mean scores. The difference between the two was 5.25 points. The math data for the students represented in each ethnic group was analyzed for both between and within subject tests. A post hoc test was conducted because there were three levels.

Based on the results, there were statistically significant differences found for Ethnicity and Time, but not for Ethnicity by Time. After conducting the Ryan-Einot-Gabriel-Welsch F test for Ethnicity, there was a significant difference between Whites and the other two ethnic groups.

Richard Coley, a researcher for the Educational Testing Service Policy Information Center found that gender differences varied little from one ethnic group to the other (Ewing, 2001). In preschool, however, only 14% of Hispanic children were able to recognize the alphabet. Twenty-five percent of African American children and 30% of other ethnic groups were able to recognize the alphabet. The deficits became critical in middle school. By the end of high school, 12.6% of African American students and 18.6% of Hispanic students have dropped out of school. This compared to 7.3% of the Whites (Salomone, 2003). This would support the statistically significant gap between African American, Hispanic and White students.

While African American and Hispanic students are closing the achievement gap between their groups and White students, the White students continue to out-pace them (National Governor's Association for Best Practices, 2006). Females have a higher rate of completion than males and have increased their educational attainment rates more quickly than the males (National Center for Educational Statistics, 2000). However, with the over-representation of males in this study, the research could not support nor contradict the research based on gender. The study did support the 2006 in which the scores of White students differed from the scores of both African American and Hispanic students (National Governor's Association for Best Practices, 2006).

Research Question #6

Were there any significant 2-factor interactions between Time and Gender, Educational Status, School Age Group, and Ethnicity?

There were no significant interactions for Gender by Time in reading or math. There were no significant interactions for Educational Status by Time in reading or math. There were no significant interactions for School Age Group by Time in reading. There were no significant interactions for Ethnicity by Time for reading or math.

Conclusions

Within the limitations of this study, the following conclusions seem warranted. The findings observed in this research suggest that while both genders achieved gains in reading and math while in a single-gender self-paced program, none of the differences were statistically significant. The performances of females and males were equal. While empirically there was no difference, the teachers at the McLennan County Challenge Academy noted changes in the behavior of both genders when separated into single-gender classrooms. The students became more focused on their academic studies. They moved at a faster pace and completed more lessons each day. Many of the students who found themselves at the Academy had been retained one or more times. Through the use of single-gender classroom, many of them advanced to a grade level, which was age-appropriate during their term of placement. Both genders appear to benefit from single-gender, self-paced instruction.

This study supports the research in which females and males begin their school careers on equal footing, but that the females begin losing ground by seventh grade

(Willis, 1995). However, only 25% of the students in the survey were females. Therefore, the reading or math scores of female students impacted this study in only a small measure.

Due to the small number of students who received both the pre and post-test in the areas of reading and math, the researcher was unable to make a statistical comparison based on female special education students versus male special education students, and female students enrolled in regular education classes versus male students enrolled in regular education classes. However, the researcher was able to compare the achievement of special education students to regular education students in the areas of reading and math after a term of 180 days in a single-gender, self-paced curriculum.

In the area of reading, the special education students achieved almost identical gains as the students enrolled in regular education. The scores of the special education students, however, were notably lower on both the pre and post-test than those of the regular education students. There was statistical significance for Educational Status and for Time, meaning that all students improved in reading from pre to post-test. However, there were no significant interactions for Educational Status by Time in the area of reading.

In the area of math, the patterns were very similar to those of reading, although more gains were noted for both groups of students. The result of the analysis was almost predictable due to the disabilities experienced by most special education students. Both groups did benefit equally from the treatment. The differences were statistically significant for Educational Status and for Time meaning that all students improved from

pretest to posttest. However, there was no significant interaction for Educational Status by Time in the area of math.

While researchers have not compared the educational achievement of special education students to that of regular education students, statistics support that females are less likely to be referred to special education or diagnosed with a learning disability, and, thus are deprived of the services which would allow them to achieve to their full educational potential (Salomone, 2003).

Because the original design of this study was not followed due to insufficient numbers, the researcher could not compare females to males with special education and regular education designations. Due to this fact, the impact of female participants was small. The researcher expected special education students to score lower on both the reading and math sections of this study due to the qualifications of special education programs. In order to be referred, students usually are behind in school to the point of failure. In the past, there had to be a discrepancy of sixteen points between the student's IQ and their performance on testing (). However, it is the researcher's experience that these students do no usually achieve at the same rate as regular education students. Therefore, no definitive conclusions could be made as to the performance of any of these students.

When making comparison by School Age Group, the findings observed in this research study lead the researcher to suggest that there was no benefit among either of the three groups in using a single-gender self-paced program in reading. There was no significance found for School Age Group and no significant interaction for School Age

Group by Time. However, there was significance found for Time in the area of reading. This means that, as a group, the average students improved their reading skills from the time they entered the program until their release.

In the area of math, Group 2, the 13-15 year olds, pre-tested at a lower level than the other two groups, however, their achievement surpassed the younger group of students represented in Group 1. The older students in Group 3 scored higher and achieved more than the other two groups. There was no significant interaction for Time and School Age Group by Time. However, there was significance found for School Age Group. This means that all students improved from the time of pre-test to post-test.

A number of conclusions might be drawn from these results. Younger students have experienced less failure and, therefore, are more open to learning new concepts. Older students, who have matured, are ready to settle down in the classroom, receive instruction, and use the information as a tool to graduate from high school. Middle school students in the age group described in the research are experiencing many changes in their lives. Adolescence, and the physical, emotional, and psychological changes that it brings, rebellion against home and school, and unclear goals often plague this group of students. School is viewed as less important than friends. With few role models in the home, students do not have a clear picture of their future. Sometimes, even if they look to the future, it is bleak, with little hope for success.

Research supports the intent of this body of work. Females begin to lag behind males in school and the deficits increase by seventh grade. As shown by the three age

groups, a decrease in the level of achievement was noted for Group 2 in both reading and math (Willis, 1995).

The researcher noted that, while all students all achieved gains, the greatest gains were noted for the youngest group of students. This would suggest that early intervention is imperative in maintaining and increasing academic achievement. As self-esteem and attitudes plummet, students are less inclined to be motivated to achieve in school.

The findings observed in this research suggest that minority students have lower achievement levels in reading than their White counterparts. They showed the least gains. Based on the results of this study, the researcher cannot conclude that Hispanic students benefit from single-gender, self-paced curriculum. While the African American students benefit from this type of instruction, they initially started at a lower level. Their rate of advances parallel those of the White students, however, they did not close the achievement gap. There was no significant interaction found for Ethnicity by Time or for Time. However, there was significance shown for Ethnicity. This significance proved to be for White students only in the area of reading.

In the area of math achievement, the same pattern appeared with minorities achieving less initially than the White students, and still remaining behind at the end of the program. The Hispanic students started at a lower level, but their achievement surpassed that of the African American students. Based on the results of this study, the African American students benefited the least from single-gender self-paced curriculum. There was no significant interaction shown for Ethnicity by Time. However, there was

significance shown for Ethnicity and for Time. After further testing, this significance was for White students only in the area of math.

The research in Chapter II supports the findings in this study. White students begin school with more skills in academics than African American and Hispanic students. This difference continues through high school where the dropout rate is higher for African American and Hispanic students than that of White students (Salomone, 2003).

Although significant differences were shown in reading and math, using this model of instruction for 180 days, one school year is not nearly enough time to shrink the gap in educational achievement between White and minority students in our school systems. In research reported in 2006, minorities closed the educational gap by 13% for African American students and 11% for Hispanic students. However, White students improved by 18% (National Governor's Association for Best Practices, 2006). The educational gap continues to exist and will expand if educational practices fail to address the problem. The results of this study exhibit growth for all three ethnic groups represented. The solution may lie in addressing the individual needs of each student rather than the needs of a homogenous group. Perhaps single-gender education would be a means to deliver education in a non-threatening environment in which students felt safe to question, answer, and explore.

More school systems are experimenting with the idea of single-gender classes, especially in the areas of math and science. Waco ISD in Waco, Texas is among those districts utilizing these theories at one of the high schools. When asked, students have

mixed opinions regarding the classes. Careful observation and data collection over time will be the true test of single-gender education. Teachers have been critical of the project because they were given two-weeks notice before the program began, they received no training in single-gender education, and the programs for females were identical to those of the males.

The state of Texas raises the passing rates for the Texas Assessment of Knowledge and Skills Test (TAKS) every year. Schools are expected to educate children who once were not even included in the school population such as mentally retarded students, emotionally disturbed students, and recent immigrants. Because of the high drug and alcohol use and abuse in the general population, children born to these parents, may be born with lower IQs and more behavior problems. These children are being integrated into mainstream classrooms and are taught the same curriculum at the same pace as all the other students. Districts are being held accountable for the performance of every student, regardless of their ability or disability, on standardized testing for the first time, during the 2007-2008 school year. School systems and programs are only able to achieve according to the capacity of the students. Every district is seeking answers and assistance in reaching all students, even though the goal is impossible to reach.

Today, the McLennan County Challenge Academy, a Juvenile Justice Alternative Education Center, continues to serve the youth of McLennan County in central Texas. There have been some changes. Students no longer remain in the same classroom with the same teacher all day. The students move from class to class so that the teachers can

specialize in core subject matter, i.e., reading, math, science, and social studies. This requires an elaborate system of restroom breaks and physical education periods so that students from different age groups, i.e., elementary school, middle school, and high school, as well as gender groups do not mix while moving from one class to the next.

Recommendations

Application of Research Findings

Society continues to have increased expectations for learning in public schools. Standardized tests are used to determine whether or not students graduate from high school. It is becoming increasingly necessary for educators to understand the differences between female and male students and to explore educational techniques and settings that maximize the learning for both genders.

Researchers should strive to locate large groups of students who can be pre and post-tested with the same diagnostic tool, receive instruction in single-gender, self-paced curriculum and compare these students with students receiving the same pre and post-testing with instruction coming from teachers in mixed gender classrooms. With these comparisons, decisions could be made regarding classroom structure, personnel, and individualized versus whole group instruction.

More students are being diagnosed annually as learning disabled (LD), and/or emotionally disturbed (ED). Increasingly, another special education label is quickly growing in students. The Other Health Impaired (OHI) label is being applied in greater numbers due to attention deficit disorder, attention deficit disorder coupled with hyperactive disorder, diabetes, sickle cell anemia, and complications from HIV, cancer,

and other life-threatening diseases. Innovative techniques designed to educate students who, due to illnesses, are absent from the instructional setting 25% or more of the time will need to be used for instruction. A self-paced curriculum would help to prevent students from being retained due to circumstances beyond their control.

Recommendations for Future Study

1. Replication of this study should be carried out involving multiple school districts in both urban and rural settings in an effort to acquire data from a larger population of students. There has recently been a movement in school districts, Waco ISD in particular, to experiment with single-gender classrooms in the content area of math and science. Comparisons between students in mixed-gender and single-gender classrooms could be made over a period of several years to make valid recommendations to school districts across the state and nation for improving both learning and test scores which affect school districts' ratings and funding.

2. Replicate this study with elementary school students. These students would represent School Age Group 1 with students ranging from 10 to 12 years of age. By doing this, research could continue over a longer period of time. Academic habits, as well as, behavioral and relational habits are established during this time. Single-gender classrooms might go a long way toward stabilizing behavior during puberty. Single-gender classrooms could provide a safer environment for learning insulated from the stress of competition in classrooms. Later, as these students progressed into middle and high school, females and males might feel more comfortable enrolling in more difficult

subject areas if they knew that they would be free from the pressures of performing in front of the opposite sex.

3. Replicate the study in another juvenile justice setting yielding pre-test and post-test results. Continued research in alternative school settings will produce more diverse techniques for educating students. Increasing numbers of students do not fit into the typical high school setting. Due to parenthood and the need to work and help support families, many students need to receive their education in atypical settings. A larger percentage of students find that they have been denied credits due to excessive absences. Education must be maximized or compressed into a smaller time period. Perhaps single-gender educational settings would maximize the learning curve so that students could achieve more in a shorter time period.

Over 80% of the students in juvenile justice settings are males. In 1992, the National Assessment of Education Progress reported that females had a higher reading proficiency than males. The reported gap was 6% (Education Testing Services, 2001). Males learn best through individual activities while females learn by building ideas through thoughts and activities that are related. It would seem only logical to address the unique learning styles of each gender.

Willis reported differences in math proficiency between females and males in 1995. Males outscore females in Scholastic Aptitude Tests (Willis, 1995). In 1980, C. P. Benbow reported a study that favored the hypothesis that males possessed superior mathematical abilities (Benbow & Stanley, 1980). Classrooms strategically focused on

gender differences and learning styles would successfully address the problem with gender gaps in education.

Single-gender education could provide a setting, which would maximize the learning of special education students, as well as those students who fail to meet the standards, which would qualify them for special assistance, but have special needs. Due to the increased use and acceptance of the use of marijuana and other illegal drugs which students are being exposed to at earlier ages, researchers have shown that an increasing number of students are diagnosed with schizophrenia, bipolar disorder and other learning disabilities. Conversely, the trend in education is to mainstream all students into regular educational settings rather than teaching special education students in resource or content mastery rooms.

This study could be replicated on regular school populations as opposed to alternative school students over a period of time and result in classroom changes that would promote student achievement for all ethnic groups. The latest report on dropouts published by the Texas Education Agency contains data stating that Hispanic students complete high school graduation requirements at the rate of 76.1% per year. African American students complete high school at a rate of 79.4% while the completion rate for White students was 86.7%. Females of all ethnic groups complete high school at an annual rate of 84.3%. The male completion rate is 79.3% (Texas Education Agency, 2005). Perhaps by being in classrooms with students of the same gender, students would encourage each other to persist and stay in school until they reach graduation.

Single-gender education in public schools would also address the issue of safety in schools. While more males are involved in violent acts on the streets, females are the targets in the hallways and classrooms of schools (Streitmatter, 1999). Relieving the stress of sexual harassment would allow females to focus on academics rather than on self-defense.

7. Combine this study with drug and alcohol treatment and prevention programs in Juvenile Justice Alternative Education Programs (JJAEP). Since the students are under the jurisdiction of the juvenile court system, this would be feasible. By simply comparing raw data scores, the researcher noted that 46% of the reading scores were lower from pre to post-test. Some math scores also were lower from pre to post-test although the percentage was lower, 25%. Only 4% of the students scored the same on both the reading and the math pre and post-tests. The researcher believes that this is due in large part to the drug and alcohol use and abuse of the students in this study. Both the parents and the students commonly admit marijuana use. Many of these students and/or their parents are named in indictments in the local newspaper charged with possession, use, manufacture, or sale of illegal drugs.

8. Establish single-gender classes within schools or establish magnet schools with this concept as its foundation. Parents and students could choose this type of education. This study could be replicated with choice rather than court-mandate.

In 2000, Amanda Datnow reported that there were benefits of academic achievement for females and low-income males reported in single-gender schools. The females were more comfortable accepting leadership roles, engaging in math, and

showed an increase in self-esteem. Classroom behavior was more manageable. These studies, however, were not conducted in public schools, but rather Catholic schools (Datnow, Hubbard & Woody, 2000). Parents of all income levels choose to send their children to these schools. Perhaps if parents were allowed to "choose" their child's schools rather than accept the assigned school, they would be more active participants in their child's education and student success would increase.

Understanding the impact of single-gender education may help educators overcome gaps in the educational achievement of females and males. There is a myriad of possibilities that may enhance student achievement and empower students to become risk-takers in a safe environment.

Closing Statement

The issue of single-gender education has been argued for decades. Not one style of classroom will ever be correct for every student. Educators have proven themselves to be the least flexible group of professionals, tending to do things "the way they've always been done." This way of thinking will not help our students keep up with the fast pace of changing technology. Educators must become students themselves and lead innovative classrooms that challenge students to become better equipped to handle real life problems. Innovation includes not only content areas and classroom climate, but also the very make-up of the classes themselves.

Little research actually exists that compares test scores of females versus males in academic areas of achievement. This is surprising due to the abundance of brain research that exists that states that females and males do learn differently. School

districts should not wait for more research to be done for them. Passing standards for the Texas Assessment of Knowledge and Skills tests are rising each year. School administrators and teachers are under increasing pressure to bring all students to meet or surpass these standards. Schools should begin programs and innovations, based on the current research, that meet the needs of individual students as if they all were special education students. Gifted programs should not be reserved for the overachievers. Students, who do not achieve academically, may be gifted in areas other than the basics. Every child should experience the joy of learning in an environment that is supportive and safe.

As with most programs that are mandated by the state, there were no guidelines provided. Students were to receive an education; however, we were not given directions as to how to achieve this goal.

The researcher was given the flexibility by the superintendent of the independent school district that served as the fiscal agent to select textbooks, write curriculum, hire teaching staff, set up a daily schedule, and write the student code of conduct and handbook for the facility. The staff was encouraged to give input into all areas. Computer were used to enhance the effectiveness of the curriculum by allowing all students to work on self-pace individualized curriculum that was designed to meet the needs of the students based on their grade level and the results of the Kaufman Test of Educational Achievement that had been administered on their first day of enrollment. Additionally, the researcher met with the incoming student and his or her parents before

enrollment to explain all of the intricacies of the program and to tour the facilities. This took from one to three hours to complete depending on the questions from the parents.

When students were absent, the parents or guardians were called each morning. Often, they did not know the whereabouts of their child. Daily challenges included students being arrested and detained the night or on weekends for violations of the law. The researcher was also in charge of the educational program at Juvenile Detention Center. Therefore, she had access to all records and could continue the educational program of the student by faxing syllabi to the other site. This also required close coordination with the Probation officers and the Juvenile Court system personnel.

The families of most of these students were extremely mobile and did not notify the school when they planned to move. A truant office was hired by the Academy to check on absent students on a daily basis. When a student moved, they were required to attend a Juvenile Justice Alternative Education facility, if one was available, in their town. If not, there were not allowed into the regular school due to their status as "expelled." If, and more likely, when the student returned to McLennan County, they were behind in their schoolwork.

Another challenge was the drug and alcohol use and abuse by the students. Often, they came to school after a night or weekend of drug use. Probation officers were allowed to drug test randomly and when we suspected specific students of this infraction. Staff had to be trained as to the signs of substance abuse and in how to effectively and safely handle these students. All personnel were certified in the "Handle with Care" restraint system mandated by the state.

The first year of existence was the most difficult. We were given a target, yet no directions for achieving our goal. As we made changes, the school improved and learning increased. During the tenure of the researcher, there were fewer than three fights. This was due, in part, to the high ratio of staff to students and the proactive plans that were put into place to minimize these issues. The school became a safe haven for students whose educational experience had not been a pleasant one. Many of the parents and students were sad to see them leave. Grades, attitudes, and attendance had improved. Many parents expressed that their child was more successful now than at any other point in their educational history. Some even stated that their child would not have ended up in a Juvenile Justice Alternative Education facility had their prior learning environment been more self-paced, individualized, and in an environment focused solely on learning.

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APPENDIX A

PERMISSION LETTER

FROM

MCLENNAN COUNTY CHALLENGE

ACADEMY

McLennan County Challenge Academy (MCCA)
3805 South 3rd Street • Waco, Texas 76706 • Phone 254-754-0803• Fax 754-6029

IRB Committee
Texas A&M University

January 7, 2002

Dear Committee Members:

As Director of Operations of the McLennan County Challenge Academy, I have full knowledge of the research proposed by Marilyn Martin. She has my permission and full support to retrieve archival testing data from our files containing the pre and posttest scores of our students. I understand that she will use data from students enrolled in the program from 1996-97 to the present school year, 2001-02 who were tested using the Kaufman Test of Educational Achievement.

Sincerely,

Bob Balshaw
Director of Operations
McClennan County Challenge Academy

APPENDIX B

AMERICAN GUIDANCE SERVICE

PUBLICATION SUMMARY FORM

McLennan County Challenge Academy (MCCA)
3805 South 3rd Street • Waco, Texas 76706 • Phone 254-754-0803• Fax 754-6029

October 26, 2001

American Guidance Service, Inc.
4201 Woodland Road
Circle Pines, MN 55014-1796

Dear Sir:

I am currently completing the research for my doctoral dissertation at Texas A&M University. I am comparing the pre and posttest reading and math scores for the students who have been enrolled in our program. We have used the Kaufman Test of Educational Achievement. My committee chairman has asked me to request the data that was used to establish validity and reliability for this instrument. Would you please send copies of this data to me at the above address?

If you require further information or have questions, please feel free to call.

Sincerely,

Marilyn Martin
Coordinator of Curriculum and Instruction

From: AISHA KHAN <AISHAK@AGSNET.com>
To: MARILYN MARTIN
Subject: Kaufman Test of Educational Achievment
Attachments: Mime.822 (Save As: Binary, Size=5840 bytes)
Message: Thank you for contacting AGS.

Here is the information you requested:

Here is the link to KTEA and Reliability and Validity
http://www.agsnet.com/pubsum/kteanu.html
<http://www.agsnet.com/pubsum/kteanu.html>

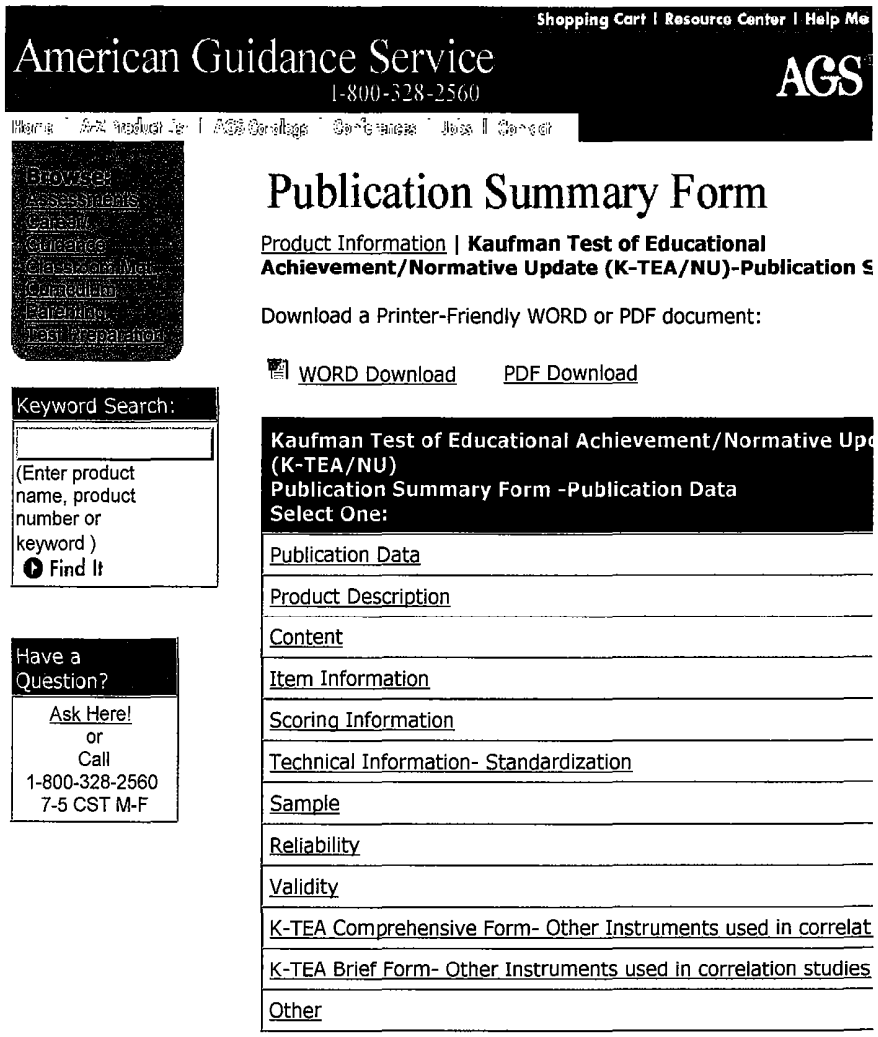
For customer service inquiries regarding orders, please email:
CustomerService@agsnet.com. We can be reached toll free at 1-800-328-2560

7-5 CST M-F.

Looking for additional information? Please visit the AGS web site at:
http://www.agsnet.com <http://www.agsnet.com/> .

Sincerely,

Aisha
Aisha Khan
Web Information Coordinator
American Guidance Service, Inc. (AGS)
1-800-328-2560 Ext. 5549
agsmail@agsnet.com



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Publication Summary Form

Product Information | **Kaufman Test of Educational Achievement/Normative Update (K-TEA/NU)-Publication S**

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Kaufman Test of Educational Achievement/Normative Up(
(K-TEA/NU)
Publication Summary Form -Publication Data
Select One:

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- Product Description
- Content
- Item Information
- Scoring Information
- Technical Information- Standardization
- Sample
- Reliability
- Validity
- K-TEA Comprehensive Form- Other Instruments used in correlat
- K-TEA Brief Form- Other Instruments used in correlation studies
- Other

Publication Data	
Instrument name/abbreviation	Kaufman Test of Educational Achievement/Normative Update
Author(s)	Alan and Nadeen Kaufman
Publisher/address	American Guidance Service, Inc. MN 55014-1796
Copyright date	1985 (content), 1998 (norms)

Return to Top

Product Description	
Brief description	Individually-administered measure of aca achievement
Primary use/purpose	Evaluate students referred for special edu
Age range covered	Ages 6:0 to 22:11; Grades 1 to 12
Administration time	Comprehensive Form: about 60 to 70 mi Brief Form: about 30 minutes
Individual vs. group	Individually administered
User qualifications	Level B

Return to Top

Content	
Domains	Reading, mathematics, and spelling
Subtest names	Comprehensive Form: Reading Decoding, Reading Comprehe Mathematics Applications, Mathematic Computation, Spelling Brief Form: Reading, Mathematics, Spelling
Composite names	Comprehensive Form: Reading Composite, Mathematics Corr Battery Composite Brief Form: Battery Composite
Forms	One Comprehensive form, one Brief fc
Materials included in the kit	Comprehensive Form: Manual, Test Easel, 25 Individual Test including error analysis, Sample Repo Brief Form: Manual, Test Easel, 25 Individual Test Sample Report to Parents

Return to Top

Item Information	
Item types	Problems presented on easel pages (usually a examiner) or on worksheets
Response format	Mostly oral or pointing; some written (spellin mathematics computation)
Item scoring	Dichotomous (1-0)

Return to Top

Scoring Information	
Scoring options	By hand or computer
Derived scores available-Subtests	Standard scores, percentiles, NCEs by grade (fall and sprin age; age equivalents and gra
Derived scores available-Composites	Same as for subtests
Norm groups available	General population, by grade spring) or by age
Interpretive features	Profile analysis of subtest sco comparison of composite scor error analysis
Computerized scoring	K-TEA ASSIST for the Compre (Windows, and Macintosh): u item scores and gets score ca profile analysis, and error ana program includes aptitude-ac discrepancy analysis

Return to Top

Technical Information- Standardization	
Description	Representative national sampling of schoolchildren adults
Date	1995-96
Size	3,429 Total Age-Norm sample 3,184 Total Grade-Norm sample 2,662 Reading Decoding domain sample 2,151 Reading Comprehension domain sample 2,802 Mathematics Computation domain sample 2,809 Mathematics Applications domain sample 2,057 Spelling domain sample Brief form equated to Comprehensive Form using equating relationship Based on Census data for 1994

Return to Top

Sample

controlled for:	**Females**	**Males**
Age/Gender	Yes	Yes
Race	Yes	Yes
Geographic region	Yes	Yes
SES/parent education	Yes	Yes
Community size	No	No
Special populations included	Yes; special education students included in representative proportions	Yes; special e students inclu representative

Return to Top

Reliability

Internal consistency	Comprehensive Form Subtests: low .90s Composites: mid to upper .90s Brief Form Subtests: mid to upper .80s Composite: mid .90s
Test-Retest	Comprehensive Form N=172, 6-day interval: correlations in the almost all subtests and composites Brief Form N=153, 7-day interval: correlations in the .80s for subtests, low .90s for composite
Interrater	Not reported

Return to Top

Validity	
Intercorrelations	Within-domain subtest interco exceed between-domain corre (Comprehensive Form)
Content	Content follows blueprints est help from expert curriculum c item content drawn from grad textbooks
Construct	Subtests show appropriate pa correlations with other achiev measures
Concurrent	See below
Predictive	None reported
Factor analysis	N/A
Clinical sample	None
Other instruments used in correlation studies	K-TEA Comprehensive Form

Return to Top

K-TEA Comprehensive Form:

Test	Reading	Mathematics	Spelling
WRAT (N=201)	.80	.70	.83
PIAT (N=52)	.82	.75	.78
K-ABC Ach (N=106)	.84	.82	
K-ABC MPC (N=106)			
PPVT-R (N=2,456)	.62		
Group Ach. Tests (N=138)	.76	.80	

Return to Top

K-TEA Brief Form

Test	Reading	Mathematics	Spelling
WRAT (N=200)	.65	.68	.77
PIAT (N=52)	.79	.59	.68
K-ABC Ach. (N=105)	.84	.75	
K-ABC MPC (N=106)			
PPVT-R (N=580)		.56	

Return to Top

Other

Developmental history	Originally developed in conjunction some subtests share items with K-/ Achievement subtests. Renormed in 1995-96 as part of a norming program that included the PIAT-R, the KeyMath-Revised, and
Special features	Error analysis; easy to learn, admir score
Federal mandates met	Appropriate for Title 1 assessments
Sensitivity to other cultures	Statistical bias analyses conducted
Training options available	None

Return to Top

APPENDIX C

RAW DATA

RAW DATA

	Gender	Ethnicity	Status	Age Group	Pre-Read	Post-Read	Pre-Math	Post-Math
1	1.00	1.00	2.00	2.00	83.00	80.00	78.00	84.00
2	1.00	1.00	2.00	2.00	77.00	95.00	77.00	89.00
3	1.00	3.00	1.00	2.00	87.00	91.00	75.00	77.00
4	1.00	3.00	1.00	2.00	84.00	98.00	84.00	102.00
5	1.00	1.00	2.00	3.00	90.00	88.00	98.00	89.00
6	1.00	1.00	2.00	2.00	89.00	90.00	88.00	94.00
7	1.00	3.00	2.00	2.00	99.00	123.00	124.00	129.00
8	1.00	2.00	2.00	1.00	77.00	78.00	83.00	93.00
9	1.00	2.00	2.00	2.00	102.00	104.00	86.00	112.00
10	1.00	2.00	2.00	2.00	84.00	93.00	85.00	80.00
11	2.00	2.00	2.00	2.00	53.00	46.00	46.00	57.00
12	2.00	1.00	2.00	2.00	42.00	48.00	46.00	61.00
13	1.00	3.00	2.00	2.00	85.00	93.00	85.00	103.00
14	1.00	1.00	1.00	2.00	88.00	95.00	87.00	93.00
15	2.00	1.00	2.00	2.00	105.00	98.00	92.00	88.00
16	1.00	1.00	1.00	3.00	72.00	86.00	57.00	71.00
17	1.00	3.00	2.00	3.00	76.00	92.00	93.00	117.00
18	1.00	3.00	1.00	1.00	52.00	52.00	60.00	62.00
19	1.00	3.00	2.00	2.00	88.00	92.00	71.00	85.00
20	1.00	2.00	1.00	2.00	84.00	89.00	90.00	89.00
21	1.00	1.00	2.00	2.00	61.00	65.00	59.00	67.00
22	2.00	3.00	2.00	2.00	104.00	104.00	116.00	112.00
23	2.00	3.00	2.00	2.00	97.00	105.00	110.00	118.00
24	1.00	2.00	2.00	2.00	88.00	42.00	80.00	86.00
25	1.00	2.00	2.00	3.00	75.00	77.00	62.00	67.00
26	1.00	1.00	2.00	2.00	86.00	91.00	85.00	86.00
27	2.00	3.00	2.00	3.00	93.00	105.00	97.00	107.00
28	1.00	1.00	2.00	2.00	74.00	73.00	67.00	71.00
29	1.00	3.00	2.00	3.00	93.00	91.00	68.00	89.00
30	1.00	2.00	2.00	3.00	98.00	101.00	80.00	98.00
31	1.00	3.00	2.00	2.00	112.00	129.00	136.00	130.00
32	1.00	1.00	2.00	2.00	103.00	102.00	90.00	90.00
33	1.00	1.00	2.00	3.00	87.00	92.00	90.00	90.00
34	1.00	3.00	2.00	3.00	95.00	97.00	74.00	90.00
35	1.00	2.00	2.00	3.00	87.00	88.00	90.00	94.00
36	1.00	3.00	2.00	3.00	92.00	111.00	92.00	121.00
37	1.00	1.00	2.00	3.00	91.00	95.00	90.00	95.00
38	1.00	3.00	2.00	3.00	109.00	96.00	83.00	94.00

39	1.00	3.00	2.00	2.00	95.00	97.00	93.00	98.00
40	1.00	3.00	2.00	2.00	123.00	125.00	129.00	126.00
41	1.00	1.00	2.00	2.00	81.00	88.00	85.00	75.00
42	1.00	2.00	2.00	2.00	98.00	111.00	109.00	132.00
43	1.00	3.00	2.00	2.00	120.00	108.00	87.00	101.00
44	2.00	3.00	2.00	3.00	86.00	99.00	90.00	85.00
45	2.00	3.00	2.00	2.00	128.00	127.00	129.00	134.00
46	2.00	1.00	2.00	2.00	81.00	91.00	73.00	78.00
47	1.00	2.00	1.00	3.00	82.00	91.00	70.00	80.00
48	1.00	2.00	1.00	2.00	83.00	81.00	94.00	99.00
49	1.00	1.00	2.00	1.00	92.00	100.00	102.00	100.00
50	2.00	1.00	1.00	2.00	85.00	91.00	77.00	83.00
51	1.00	2.00	2.00	2.00	103.00	101.00	108.00	108.00
52	2.00	1.00	1.00	2.00	79.00	75.00	73.00	79.00
53	2.00	1.00	2.00	2.00	87.00	84.00	94.00	95.00
54	2.00	3.00	2.00	2.00	86.00	92.00	74.00	86.00
55	1.00	2.00	1.00	2.00	82.00	82.00	73.00	77.00
56	1.00	1.00	2.00	2.00	78.00	77.00	56.00	69.00
57	1.00	1.00	1.00	1.00	77.00	99.00	91.00	103.00
58	1.00	2.00	2.00	3.00	92.00	91.00	109.00	108.00
59	1.00	2.00	1.00	1.00	75.00	86.00	78.00	93.00
60	1.00	2.00	1.00	3.00	89.00	91.00	73.00	74.00
61	1.00	1.00	1.00	2.00	61.00	60.00	66.00	71.00
62	1.00	2.00	2.00	3.00	94.00	93.00	102.00	96.00
63	1.00	3.00	2.00	2.00	109.00	78.00	106.00	88.00
64	2.00	1.00	1.00	2.00	67.00	70.00	79.00	84.00
65	1.00	2.00	1.00	3.00	61.00	61.00	67.00	78.00
66	1.00	1.00	2.00	1.00	88.00	93.00	116.00	117.00
67	2.00	2.00	2.00	2.00	95.00	92.00	89.00	102.00
68	1.00	2.00	2.00	2.00	86.00	92.00	109.00	98.00
69	1.00	1.00	1.00	2.00	76.00	74.00	62.00	62.00
70	2.00	1.00	2.00	3.00	85.00	79.00	97.00	97.00
71	1.00	3.00	1.00	2.00	85.00	95.00	79.00	90.00
72	2.00	1.00	2.00	1.00	87.00	97.00	85.00	94.00
73	1.00	1.00	2.00	3.00	94.00	100.00	97.00	106.00
74	1.00	1.00	2.00	1.00	105.00	101.00	116.00	109.00
75	1.00	3.00	2.00	1.00	107.00	103.00	96.00	96.00
76	2.00	1.00	1.00	1.00	85.00	81.00	79.00	90.00
77	1.00	3.00	1.00	2.00	129.00	110.00	112.00	103.00
78	1.00	1.00	2.00	2.00	95.00	97.00	79.00	82.00
79	1.00	3.00	1.00	2.00	82.00	84.00	75.00	77.00
80	1.00	1.00	1.00	3.00	83.00	80.00	87.00	73.00

81	2.00	1.00	2.00	2.00	97.00	99.00	115.00	113.00
82	1.00	2.00	2.00	2.00	95.00	93.00	98.00	99.00
83	1.00	3.00	1.00	1.00	94.00	93.00	77.00	78.00
84	1.00	3.00	2.00	1.00	105.00	100.00	79.00	89.00
85	1.00	3.00	2.00	2.00	95.00	88.00	102.00	106.00
86	2.00	2.00	1.00	2.00	84.00	86.00	82.00	92.00
87	1.00	3.00	2.00	2.00	113.00	102.00	117.00	97.00
88	1.00	1.00	2.00	2.00	95.00	98.00	94.00	98.00
89	1.00	1.00	2.00	2.00	84.00	89.00	87.00	99.00
90	1.00	1.00	1.00	3.00	53.00	56.00	60.00	66.00
91	1.00	2.00	2.00	2.00	84.00	86.00	76.00	83.00
92	2.00	2.00	1.00	1.00	75.00	76.00	66.00	74.00
93	1.00	1.00	1.00	2.00	96.00	93.00	92.00	107.00
94	1.00	1.00	2.00	2.00	88.00	94.00	105.00	106.00
95	1.00	1.00	2.00	1.00	92.00	82.00	81.00	94.00
96	2.00	2.00	1.00	2.00	74.00	72.00	65.00	64.00
97	2.00	1.00	1.00	2.00	77.00	78.00	74.00	91.00
98	2.00	2.00	2.00	2.00	89.00	86.00	81.00	96.00
99	2.00	1.00	2.00	1.00	81.00	84.00	80.00	87.00
100	1.00	3.00	2.00	2.00	132.00	139.00	119.00	120.00
101	1.00	1.00	1.00	2.00	49.00	49.00	52.00	53.00
102	1.00	1.00	1.00	2.00	74.00	75.00	88.00	81.00
103	1.00	1.00	1.00	2.00	72.00	72.00	74.00	75.00
104	2.00	1.00	2.00	2.00	90.00	86.00	80.00	79.00
105	2.00	1.00	2.00	2.00	82.00	93.00	74.00	89.00
106	1.00	3.00	2.00	2.00	109.00	131.00	127.00	132.00
107	1.00	1.00	2.00	1.00	80.00	79.00	102.00	96.00
108	1.00	3.00	1.00	2.00	60.00	56.00	56.00	56.00
109	1.00	3.00	1.00	3.00	87.00	91.00	76.00	79.00
110	1.00	3.00	2.00	3.00	89.00	90.00	77.00	86.00
111	1.00	3.00	2.00	1.00	85.00	84.00	90.00	96.00
112	1.00	1.00	1.00	3.00	79.00	85.00	121.00	109.00
113	2.00	1.00	2.00	2.00	93.00	89.00	102.00	100.00
114	2.00	1.00	2.00	2.00	97.00	93.00	108.00	103.00
115	1.00	2.00	1.00	1.00	73.00	78.00	60.00	66.00
116	2.00	3.00	2.00	2.00	82.00	81.00	90.00	88.00
117	1.00	1.00	1.00	2.00	63.00	61.00	84.00	80.00
118	2.00	3.00	2.00	2.00	92.00	84.00	84.00	87.00
119	1.00	1.00	1.00	2.00	84.00	81.00	74.00	70.00
120	1.00	3.00	1.00	2.00	77.00	76.00	84.00	84.00
121	1.00	2.00	1.00	2.00	88.00	89.00	79.00	82.00
122	1.00	1.00	1.00	3.00	83.00	80.00	78.00	84.00

123	1.00	1.00	1.00	2.00	86.00	88.00	66.00	70.00
124	2.00	1.00	1.00	2.00	89.00	85.00	87.00	87.00
125	1.00	1.00	1.00	2.00	80.00	88.00	72.00	72.00
126	1.00	1.00	1.00	2.00	61.00	59.00	69.00	72.00
127	1.00	1.00	1.00	3.00	87.00	81.00	85.00	95.00
128	1.00	1.00	1.00	2.00	103.00	93.00	100.00	99.00
129	1.00	1.00	1.00	2.00	77.00	80.00	69.00	62.00
130	2.00	3.00	1.00	2.00	101.00	104.00	131.00	119.00
131	1.00	1.00	1.00	1.00	59.00	62.00	76.00	82.00
132	2.00	2.00	1.00	2.00	83.00	82.00	89.00	83.00
133	1.00	1.00	2.00	2.00	83.00	85.00	89.00	91.00
134	1.00	3.00	2.00	3.00	136.00	135.00	122.00	132.00
135	2.00	1.00	2.00	2.00	107.00	103.00	108.00	111.00
136	2.00	3.00	1.00	1.00	60.00	57.00	61.00	66.00
137	1.00	3.00	2.00	3.00	123.00	136.00	118.00	114.00
138	1.00	1.00	2.00	3.00	86.00	115.00	99.00	116.00
139	1.00	1.00	2.00	1.00	80.00	88.00	95.00	89.00
140	1.00	2.00	1.00	3.00	61.00	57.00	78.00	85.00
141	2.00	3.00	2.00	1.00	122.00	119.00	122.00	130.00
142	1.00	3.00	1.00	1.00	92.00	90.00	87.00	94.00
143	1.00	2.00	2.00	3.00	97.00	93.00	108.00	124.00
144	1.00	1.00	2.00	2.00	75.00	72.00	90.00	84.00
145	1.00	1.00	2.00	3.00	81.00	80.00	79.00	80.00
146	1.00	3.00	1.00	2.00	91.00	98.00	85.00	108.00
147	1.00	1.00	2.00	3.00	86.00	84.00	94.00	82.00
148	1.00	1.00	2.00	2.00	87.00	86.00	99.00	97.00
149	1.00	3.00	1.00	2.00	60.00	63.00	71.00	79.00
150	1.00	2.00	1.00	2.00	82.00	83.00	69.00	74.00

VITA

MARILYN ANN MARTIN

Business Address:
Falls Education Co-op
130 Coleman Street
Marlin, Texas 76661
Telephone (254) 803-2152
Fax (254) 883-6956

Home Address
552 Smith Lane
P.O. Box 1077
Bruceville, Texas 76630
(254) 859-3673

PROFESSIONAL EDUCATION:

Baylor University
Master of Science degree, Educational Administration, 1997
Texas A&M University
Bachelor of Science degree, Education, 1971

PROFESSIONAL EXPERIENCE:

Falls Education Co-op, Curriculum Director, 2007-Present
Falls Education Co-op, Principal, The Learning Center 2004 – 2007
Falls Education Co-op, Principal, Disciplinary Alternative Education Program, 2003-2004
Baylor University, Dept. of Educational Psychology, Part-time Lecturer, 2001
College of the Southwest, Adjunct Professor, 2001
McLennan County Challenge Academy (JJAEP) Coordinator of Curriculum and Instruction, 1996 – 2003
Temple ISD, Teacher, grades K-5, 1974-1996

PROFESSIONAL ORGANIZATIONS:

Association for Supervision and Curriculum Development
Alpha Delta Kappa
National Association of Secondary School Principals
Phi Delta Kappa

COMMUNITY ACTIVITIES:

Waco Federation of Women's Club
Booker T. Washington Resource Center, Board Member
Boys and Girls Club of Falls County, Board Member, Secretary
Communities in Schools – Heart of Texas, Board Member
Lions' Club, Founding Member, Board Member, Treasurer
Rotary Club, Board Member, Board Member, President
DARE Bears Association, Baylor University, Off-Campus Sponsor
Texas Association for the Improvement of Reading, Advisory Board
Community Resource Coordinating Group of Falls County
Hot of Texas Therapeutic Riding Club, Board Member, President
Falls County Boys and Girls Club, Board Member, Secretary